SPECIAL ELECTRIC STREET RAILWAY EDITION.—II.

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JOEL HURT, OF ATLANTA.

THE NEW PRESIDENT OF THE AMERICAN STREET RAILWAY ASSOCIATION.

Mr. Joel Hurt, president of the Atlanta Consolidated Street Railway Company, has been elected president of the American Street Railway Association for the ensuing year. It was through Mr. Hurt's efforts that the American Street Railway Association selected Atlanta as the place for holding its thirteenth annual convention, and Mr. Hurt is largely responsible for the success of this recent meeting.

Mr. Hurt was born in Russell County, Alabama, in 1850, and was graduated from the University of Georgia in 1871, with the degree of civil engineer. He immediately accepted a position with the Atlantic and Pacific Railroad, and was put in charge of preliminary surveys in Arizona. After this he spent two years with the Northwestern Railroad of Georgia on surveys and construction. His commercial career was inaugurated by his becoming an insurance and real estate broker. He was elected secretary of the Atlanta Home Insurance Company in 1882, and organized the East Atlanta Land Company, which developed a large tract of land in the vicinity of Atlanta.

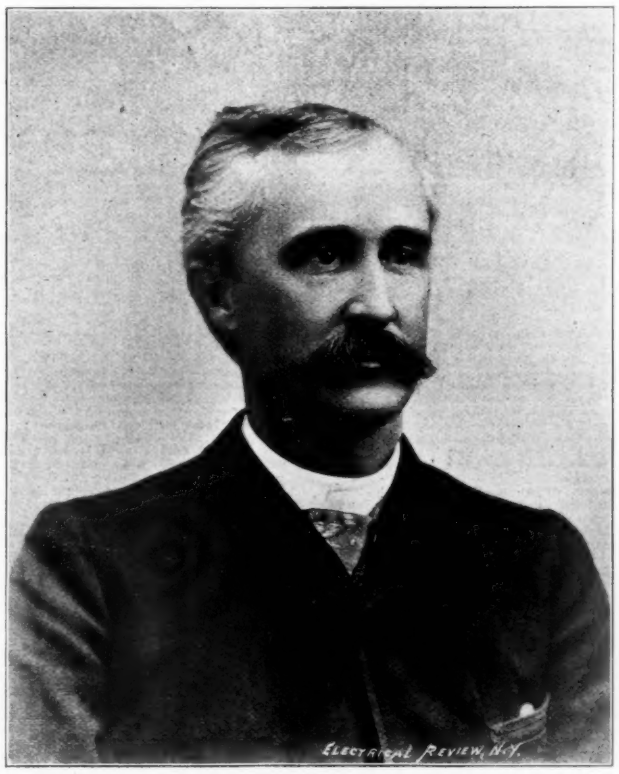
In 1891 Mr. Hurt was elected president of the Atlanta Consolidated Street Railway Company, and at once decided to consolidate the various street railways of the city under one management and equip them electrically. As a result of his endeavors five lines were placed under one management and the system now includes 64 miles of track. The Consolidated system is one of the best constructed and best managed systems in the Southern States. Mr. Hurt is one of the most enthusiastic and energetic supporters of the American Street Railway Association and served as its second vice-president during 1892 and '93.

The advantages of Montreal as a convention city and the hospitality of its citizens are well known to the members of the National Electric Light Association and their friends. The ELECTRICAL REVIEW has no doubt that the next convention of the American Street Railway Association, to be held in Montreal, with Mr. Hurt at the helm, will be equally as successful, from both a business and social standpoint, as was that of the National Electric Light Association.

VIEWS, NEWS AND INTERVIEWS.

During the last year the Western Union Telegraph Company bought about 12,000 miles of copper wire, and since the annual report was made 10,000 miles of additional copper wire were bought. All of it is charged to operating expenses. The company has just completed the construction of a heavy through copper wire to San Francisco with a low resistance, which will enable the company to work direct with San Francisco from New York. The weight is 250 pounds to the mile—the greatest weight known to the telegraph service. The standard weight of the company is 210 pounds to the mile.

A dispatch from Riverhead, Long Island, on October 12, said that the power of Hallett's electric light plant was shut off during a storm on the previous Wednesday. It is furnished by a water wheel, which is also the source of supply for a neighboring flour mill. The big water wheel slowly slacked in speed and finally stopped altogether. Every effort to start it was futile, and finally workmen were sent to investigate. They found that it was entirely choked by eels to the number of thousands. A crowd soon gathered with baskets, and as fast as the workingmen would pick off the eels the town folks would gather them. The eels ranged from five and six pounds to a size so small that the workmen had to use pincers to pick them off the wheel.



MR. JOEL HURT, OF ATLANTA, GA., PRESIDENT-ELECT OF THE AMERICAN STREET RAILWAY ASSOCIATION.

TRACTION ADVOCATES.

ATLANTA FILLED WITH ENTHUSIASTIC STREET RAILWAY MEN AND REPRESENTATIVES OF ALLIED INTERESTS.

THE MOST SUCCESSFUL CONVENTION IN THE HISTORY OF THE ASSOCIATION—WELCOME BY THE GOVERNOR OF GEORGIA AND RESPONSE BY PRESIDENT PAYNE—PROGRAMME OF ADDRESSES AND DISCUSSION FRUITFUL AND IMPORTANT—THE EXHIBIT EXCELS ALL EXPECTATION, AND THE CHIEF OF ALL WERE THE APPLICATIONS OF ELECTRICITY—RECEPTIONS AND DRIVES BY THE WARM-HEARTED PEOPLE OF ATLANTA—BANQUET AND TOASTS—CHATTANOOGA VISITED—JOEL HURT, OF ATLANTA, ELECTED PRESIDENT, AND MONTREAL SELECTED FOR THE NEXT MEETING PLACE.

The special trains that unloaded in Atlanta last week brought traction representatives and wives and sweethearts from all parts of this great country of ours, including Canada. The attendance at the convention of the American Street Railway Association there, extending through October 17, 18 and 19, was variously estimated at from 600 to 1,000, and the latter figure is probably nearer the correct one. Hotel accommodations were at a premium, yet all were fairly comfortably housed. The soft Southern accent, mingled with the snappy utterances of the electrician and traction advocate, and kindly words and acts of welcome were to be met with by the visitors on all sides.

Atlanta has again added to her laurels as the queen of hospitality, and it gives the ELECTRICAL REVIEW the greatest pleasure to here record it.

The delightful reception given to the ladies and gentlemen at the Capi-

tal City Club by President Mims, assisted by brilliant Mrs. Emma M. Thompson and charming and talented Mrs. Loulie M. Gordon, was the social event of the week and captured the hearts of the sturdy tractionists from the North. All of them will want to again visit beautiful, hospitable Atlanta.

Wednesday's Session.

The 13th annual convention of the American Street Railway Association was held in Machinery Hall, Piedmont Park, Atlanta, Ga., October 17, 1894. President Henry C. Payne, of Milwaukee, Wis., called the meeting to order at 10.30 A. M. and introduced Hon. W. J. Northen, governor of Georgia, who said:

Just as I was about to retire last night the president of the Street Railway Company of this city called me up on the telephone and commanded me to appear upon this occasion to say some words of welcome to this convention. I reminded him that there were duties in my office of an imperative character which demanded my attention at the hour named for your assembling. He said that there were no duties connected with my office that could be compared to the importance of this convention to Georgia and the South, and that I must be on hand. I reminded him that I should be at my office to make preparations for the incoming of my successor. He then said again that there was no duty which Georgia demanded at my hands higher than to speak words of welcome to this distinguished body of gentlemen who have come to the South. (Applause.)

It did not avail with the president of the Atlanta Street Railway Company for me to say that I had already anticipated this duty and that I had already spoken words of welcome to this convention through your ELECTRICAL REVIEW, and that I could not say any more should I speak to-day. You must know that the people of Atlanta have learned that when Joel Hurt touches the button we must do the rest. (Applause). I am not here, however, gentlemen, to speak simply because of the invitation that now appears to be more of a command; but I am here to speak for the people of this great State, and for the people of this great section, to extend to you a most hearty and cordial greeting.

I daresay many of you have never been to Georgia, and possibly never to the South before. We are glad to have you come down here and know personally of our delightful climate. The hottest day I have experienced in the past five years was not in Georgia, but was in Toronto, Canada, and the next hottest day was in Nebraska. I had the honor to make an address to the people of Nebraska, and the thermometer was 107 degrees, and under my vest it was 205, when in my own State on the same day it was only 90 degrees. Now, I may say that this is simply nature's compensation in heat and cold, and that there is a mistaken idea of the intense heat of Georgia and the South. In Toronto they told me that they had only the months of May, June, July and August in which they put the grain into the ground, for its development and its maturity. This is all done in four months, and, therefore, there must necessarily be a concentration of heat in Northern sections, which is not necessary in the South, where we spread our Summer from January to December. Our climate is balmy, delightful and sunny, and to-day is a representative one of the climate of our magnificent State.

We are delighted to have you here, furthermore, because we want to have you learn what are the productions and resources—agricultural, mineral, timber and industrial—of this section; and I am sure, after having looked upon the developments now being made upon these grounds and the prospect that awaits us in the development of our exposition, that you will not only return to Atlanta then to visit our exposition, but that you will bring your industries and settle in Georgia and help us develop the great interests of this great State. (Applause.)

We want you to know that the financial conditions of Georgia and the South have been equal to, if not better than, any other sections in this great country of ours. In the last financial stress that came upon the people of this country there were fewer bank failures and business failures at the South than in any other section. The records show that the people of the South owe less money than any other section. Land mortgages for 14 Southern States amount to $33,000,000 for each State on an average; the average for 14 Northern States is $344,000,000. The average annual interest paid by the 14 Southern States upon mortgages is $2,600,000; for the 14 Northern States it is $21,900,000. The average per capita of mortgage indebtedness for the 14 Southern States is $25.00; the 14 Northern States is $129.

We are glad to welcome you for we honor you, and you know the people at the South are warm-hearted, genial, social and hospitable, and in this respect are equal to any, not only on this continent, but in all the civilized world. We are glad to welcome you because you are business men; you are business men who consider questions of interest from the standpoint of men who have large interests at stake and who have capital to invest, and we invite you to Georgia for their investment. Why not make street car wheels out of pig iron at the South manufactured at the South; why not make street railway rails out of pig iron at the South manufactured at the South; why not remove your industries from more expensive sections down to this section, where you buy cheaper raw material, where you have better advantages of manufacturing and your business interests can be better developed.

You have developed your own business in the South to a very great extent. We have 1,611 miles of street railways in the South. You have put in for the Southern States, and the Southern States have helped you put it there, and invested capital in this industry amounting to $71,000,000, and all that has been done at the South within the last six years. We welcome you again because you represent the greatest factor of civilization known to the Northern world. (Applause.) You have enhanced the value of this great country of ours more than any other half dozen factors for producing wealth that have been incorporated for the last quarter of a century. You broaden out cities, you scatter the density of population you make it convenient for the professional man, for the business man and for the laboring man to go from his home to his work with the least expenditure of time.

How can we stand in the presence of such an organization, the members of which have for their object such high purposes, without bowing in the highest possible appreciation of their work, and saying that Georgia and the South give you a most cordial welcome. (Long applause.)

President Payne responded in behalf of the association as follows:

Speaking for myself and feeling that I voice the sentiments of every member of the association I beg to return cordial thanks to the governor of Georgia for the hospitable manner in which he has welcomed us to this fair city of the South.

I am sure that we shall all carry away with us warmest feelings of friendliness for the city of Atlanta. We have all anticipated our visit to this city with genuine pleasure and I am sure that we will look back upon our convention here as one of the most pleasant we have ever held or could ever hope to hold. Atlanta is a proverbially hospitable city. We already feel the generous greeting in every handshake. We are glad to be here.

The street railway business is so closely identified with the best interests of every city, that it is no wonder that a body like this is made to feel at home in the active, thriving cities of the land. Once more I voice the sentiments of every man here and return thanks to the governor of Georgia for his friendly greeting here to-day. (Applause.)

The President's annual address to the association was then delivered and follows in full:

Gentlemen of the Association: For your partiality in electing me to the office of president of the association I desire to return my most heartfelt thanks.

It is hardly necessary for me to say that since our last meeting the street railway business has suffered, in common with all other enterprises, owing to the financial stringency and business depression which has prevailed in all parts of the country. These conditions, however, have not been without lasting benefit to the interests which we represent. I think we have all studied more thoroughly to bring about economies in operation, to limit construction of new lines into unproductive territory, and in every way to bring our business to a more healthy basis; so that from that point of view there is compensation for the depression through which we have passed. I presume it is the common experience of all that we are on the upgrade, and I confidentially anticipate a slow but gradual return to normal business conditions. The resources and characteristics of the American people are such that they cannot long continue in a state of either mental or financial depression.

During the transition period from animal to electric power on the tramways of our country, it was but natural that the proceedings of the annual meetings of the association should be largely taken up with the consideration of the application of electricity to transportation purposes. Now that we may fairly consider such application as an accomplished fact, I think our attention to a greater degree be turned to a comparison of views regarding the practical operation of our several roads.

The substitution of electricity for animal power has elevated the business to a higher plane. Street railways have become as essential to the prosperity of our metropolitan cities as the steam railways to the country at large.

Having had practical experience in the management of both these methods of transportation, I can fairly say that the duties of the manager of a street railway equipped for rapid transit are more vexatious than, and require quite as much ability, intelligence and application as, those of one in charge of a steam railway. The steam railway manager makes his time tables, publishes them and the people are expected to and do suit their convenience to the same. Not so with us. We are expected to make our time tables to conform to the convenience of each individual separate passenger who desires to be transported, and a car is expected to be at each and every corner at the identical moment when the passenger is ready to be carried.

Again, the steam railway manager has to encounter legislatures and legislation but once in two years, or at the most once in each year, and that during a short period in the Winter only; while the life of the street railway manager is made unhappy, to say the least, by the legislative bodies in cities, which are practically in continuous session.

The American capitalist is quick to discover promising fields for the investment of capital, and I think it is safe to say that never in the history of our country has there been a more rapid development than has come from the application of electricity to transportation purposes. In the anxiety to secure franchises and to reconstruct street railways very excessive valuations have been placed upon and paid for the right to operate by electricity in our large cities. This has led the representatives of the people to believe that there is a present value attached to franchises far beyond that which the facts will sustain.

Consequently, these conditions have led to a fruitful field for the legislator, as well as for the assessor, from whose tender solicitude for the welfare of the people, the street railways, whose prosperity contributes so much to the general good, have suffered.

The interest, as well as the inclination, of most managers tends toward giving as liberal and good a service to the public as the patronage will justify.

Transfers and to what extent they should be granted, commutation and its effect upon earnings, and the relative earnings of cars operated on long and short time headway, furnish fruitful topics for discussion and comparison of views. These, and many other practical subjects, which will occur to you, I think should receive our attention, and I believe their consideration will be not only of great interest, but of material advantage to us all.

Your Executive Committee has set apart one morning for executive session, at which time, I trust, we shall have full and free exchange of views bearing upon matters to which I have referred, and many others affecting the practical operation of our roads.

The question of insurance has become a perplexing one. In many instances the larger systems find it very difficult to obtain insurance in sufficient amounts to cover their risks and, I think, the common experience is that rates have increased to such an extent as to be so burdensome as to justify us in considering the propriety of organizing a mutual insurance association.

I cannot close without referring to the great loss which we have suffered from the removal by death since our last meeting of two of our most prominent and active members.

Mr. William Richardson, of Brooklyn, N. Y., had been identified with the association since its organization. All will recall the great interest which he took in our deliberations, and I am sure that we all feel a sense of personal sorrow that we shall no more have his wise counsel. His life's work, so far as business activities were concerned, was completed, and he was looking forward to that quiet and peaceful ending of his days to which a long and active life had entitled him.

Mr. William J. Stephenson, of Washington, D. C., first vice-president of the association, was, to my mind, an almost perfect type of an aggressive, forcible, intelligent business man. He had been for a considerable time engaged in maturing plans for the introduction of the underground trolley system upon his road. To this end he had succeeded in obtaining the necessary legislation from Congress, and his plans were very far matured toward the actual commencement of the work of reconstruction. We cannot but regret that he has not lived to consummate the plans which he had so ably matured. Mr. Stephenson was looking forward with the greatest interest to this meeting, and I am sure that I but reflect the sentiment of every member in expressing my sorrow and regret at his untimely taking off.

REPORT OF EXECUTIVE COMMITTEE.

The Executive Committee submitted the following report:

The hard times affect the street railway business as surely as they do any other. The fare is so small, only a nickel, that one of the unthinking public is surprised when he learns for the first time that business depression affects the receipts of a street railway company. The fact is there is no more accurate test or measure of the state of the business of the country than the varying income of a street railway company, showing with absolute accuracy the state of business activity or depression in the community. Business in general during the last year has been bad, and the street railway business in particular has suffered, several of the member companies having gone into receivers' hands, while consolidation still continues to be the trend of the times. While the year has been a hard one, the business outlook is encouraging, and we look forward with confidence to a successful year's business. At the opening of the meeting in the City of Milwaukee, there were 197 member companies.

At that meeting and during the year the following companies have joined:

Camden, N. J.—Camden, Gloucester and Woodbury Railway Co.
Charleston, S. C.—Enterprise Railroad Co.
Columbia, S. C.—Columbia Electric Street Railway, Light and Power Co.
Helena, Mont.—Helena Rapid Transit Railroad.
Macon, Ga.—Macon and Indian Spring Electric Street Railway Co.
Mobile, Ala.—Mobile Electric Light and Railway Co.
Nashville, Tenn.—Nashville Traction Company.
New Britain, Conn.—Central Railway and Electric Co.
Newburg, N. Y.—Newburg Electric Railway Co.
New Orleans, La.—New Orleans Traction Co., Limited.
Paterson, N. J.—Paterson, Passaic and Rutherford Electric Railway Co.
Poughkeepsie, N. Y.—Poughkeepsie City and Wappinger's Falls Electric Railway Co.
Rockland, Me.—Rockland, Thomaston and Camden Street Railroad Co.
Tampa, Fla.—Tampa Electric Light and Street Railroad Co.

The following changes in the names of members have taken place:

Brooklyn, N. Y.—Brooklyn, Queens County and Suburban Railroad Co. in place of Broadway Railroad Co.
Carbondale, Pa.—Lackawanna Valley Rapid Transit Co. in place of Carbondale Traction Co.
Kansas City, Mo.—Kansas City Cable Railway Co., Consolidated, in place of Kansas City Cable Railway Co.
Nashville, Tenn.—Nashville Street Railway in place of United Electric Railway.
New York, N. Y.—Metropolitan Street Railway Co. in place of Houston, West Street and Pavonia Ferry Railroad Co.
Norwalk, Conn.—Norwalk Street Railway Co. in place of Norwalk Horse Railroad Co.
Washington, D. C.—Belt Railway Co. in place of Capital, North O Street and South Washington Railway Co.

The following changes of names of companies, by substitution and consolidation, the new companies succeeding the old, have taken place:

Jersey City, N. J.—Consolidated Traction Co. in place of the Jersey City and Bergen Railroad Co. and the New Jersey Traction Co., of Newark, N. J.
Lawrence, Mass.—Lowell, Lawrence and Haverhill Street Railway Co. in place of Haverhill and Groveland Street Railway Co., and Merrimack Valley Street Railway Co., of Lawrence, Mass.
San Francisco, Cal.—Market Street Railway Co. in place of City Railway Co., and Ferries and Cliff House Railway Co.
St. Louis, Mo.—Union Depot Railway Co. in place of the Benton-Bellefontaine Railway Co.

The following companies have withdrawn, several of them having gone into the hands of receivers or leased to other companies, and nearly all of them being very weak financially:

Alexandria, Va.—Washington, Alexandria and Mt. Vernon Ry. Co.
Amsterdam, N. Y.—Amsterdam St. Railroad Co.
Birmingham, Conn.—Derby Street Railway Co.
Cincinnati, O.—Mt. Auburn Cable Railway Co.
Dover, N. H.—Consolidated Light and Power Co.
Erie, N. Y.—Erie Electric Motor Co.
Findlay, O.—Findlay Street Railway Co.
Lancaster, Pa.—Lancaster Street Railway Co.
Lyons, Ia.—Clinton and Lyons Horse Railroad Co.
Nashua, N. H.—Nashua Street Railway Co.
New York, N. Y.—North and East River Railroad Co.
Peoria, Ill.—Fort Clark Horse Railway Co.
Raleigh, N. C.—Raleigh Street Railway Co.
Yonkers, N. Y.—Yonkers Railroad Co.

As a result of the foregoing changes, the membership now numbers 136 companies.

The special reports and papers that have been prepared cover a wide range of subjects and express the latest thought and practice in the business.

The exposition of street railway supplies will be found of unusual interest, the products there displayed being the latest expression as to the needs of a street railway, especially if the motive power be electricity.

Judicial decisions and opinions have been issued during the year and constitute parts of volumes X and XI of "Street Railway Law," as follows:

1893.

November—George Rouser *vs.* North Park Street Railway Co.
December—W. L. Allen *vs.* Birmingham Railway and Electric Co.

1894.

January—John C. Bleil *vs.* Detroit Street Railway Co.
February—George A. Jennings *vs.* Tacoma Railway and Motor Co.
March—Otto J. Lang *vs.* Houston, West Street and Pavonia Ferry Railroad Co.
April—Catherine King *vs.* Second Avenue Railroad Co.
May—James E. Johnson et al. *vs.* Reading City Passenger Railroad Co.
June—James E. Morgan *vs.* Jersey City and Bergen Railroad Co.
July—Mary Flanagan *vs.* People's Passenger Railway Co.
August—Lena T. Cleveland *vs.* Bangor Street Railway Co.
September—State of Minnesota *vs.* Frank S. Hoskins and Dow S. Smith.
October—Youngstown Street Railway Co. *vs.* Elmer Haverstick and 115 others.

AMERICAN STREET RAILWAY DECISIONS.

The second volume of the work, started some years since, entitled "American Street Railway Decisions," has been printed and is now in the binder's hands and will be issued to subscribers during November.

The editors have copy in hand to push the work to a speedy conclusion, and they promise to bring the matter down to date as rapidly as possible, consistent with accuracy. Companies that have not already subscribed for the work are reminded to send in their subscriptions. The price is $5 a volume, net, delivered.

It is with unfeigned pride that we regard the journals devoted to the street railway business. We desire as a committee to acknowledge the services of their owners to this association in their earnest endeavors to increase the membership, and hereby express our appreciation of their efforts to make their publications the peer of any other trade papers in the land. The souvenir editions for fine character of typography, high grade of illustrations and thoughtful care in composition evidence the desire of their proprietors to set the best that is procurable before their readers. We heartily wish them all possible success in their earnest endeavors to excel.

The report concluded with obituary notices of William Richardson, of Brooklyn; John H. Dalzell, of Pittsburgh, and William J. Stephenson, of Washington, D. C.

The report of the treasurer was presented and approved, and showed the financial transactions of the year to have been:

Receipts	$8,290.79
Expenses	8,196.72
Balance	$94.07

A communication from the Georgia Electric Light Company was read, extending an invitation to the delegates to visit the plant.

The first committee report presented was on "The Best Method of Treating Accidents and Complaints." The report was presented by Mr. P. M. Dyer, claim agent of the West Chicago Street Railroad Co.

Mr. Dunlop, of Washington: We have been pursuing that course exactly as the gentleman has represented, and if I had been writing the paper I should have said about the same thing.

Mr. Payne: The course pursued by the Chicago companies is practically that pursued by the company which I represent; and I presume our experience is the same as all of you, that we have very little chance before a jury, and the sooner we settle a case the better it is for the company. It does not seem to make much difference what the merits of the case are; if we go before a jury we are almost sure a case will go against us. It is only in cases where the points of law are in our favor that we stand any chance of success.

Mr. Littell, of New Orleans: I would like to ask Mr. Dyer when he gets a statement from his employés if it is sworn to before a notary public?

Mr. Dyer: Sometimes, but not always.

Mr. Littell: Where a motorneer is responsible for an accident, either to a vehicle or a person, and you know he is responsible, what do you do with him?

Mr. Dyer: It depends upon the frequency of his accidents, what record he has, and sometimes we assess it against him.

Mr. Littell: Suppose that you had evidence that the car was going down the street eight or 10 miles an hour, and the motorman had his head turned away and ran over a person and cut off his legs, what would you do with your man?

Mr. Dyer: He would be discharged.

Mr. Littell: Discharged immediately?

Mr. Dyer: He would be suspended pending an investigation, and then he would be discharged.

Mr. Littell: You would discharge him as soon as you got his statement?

Mr. Dyer: Yes; because if we did not do that and retained him in our employ, we would be criticised for having kept such a man in our employ and it would get before the jury.

Mr. Shaw, of Newburyport: Would it make any difference from what cause he was looking off? I ask the question because I want to state a case.

Mr. Dyer: I do not think we would accept any excuse if he did not have his car under control.

Mr. Shaw: In a road I am interested in the motorman had his attention attracted by a bicycle alongside of his car, at the time that he should have been attending to his duty. There was a car ahead of him that was grounded. He had, however, no reason to suppose that this car would stop or ground in a locality where there were no houses, but in the moment that he was looking at the bicycle he ran up on the other car and caused an accident. What would you do in that case?

Mr. Dyer: I think that would be a matter entirely for the discretion of the superintendent.

Mr. Shaw: We decided to let that man go, although I thought it was a hardship to do so.

Mr. Fuller, of Chicago: I will say for the information of the gentlemen that it is a rule of the West Chicago Railway Company that one car approaching another car must slow down or stop before getting to it, and if the motorman does not do so he is discharged.

Mr. Shaw: Our rule is to keep cars 500 feet apart. In this case where we discharged the man he was within 175 feet of the other car. If he had been 500 feet away we would have felt differently about it. That is the second instance where we have had a ground without apparent cause. We found it was the rheostat that the cable had broken and made a contact.

Mr. Littell: Has Mr. Dyer brought with him the various blank forms used for accident reports and interrogatories sent out?

Mr. Dyer: I have not. The West Chicago Street Railway Company uses a report without any special interrogatories. The statement which is sent from the office is made up with a view of interrogating the witness as to the occurrence in a general way, touching upon the more important points and then leaving it for the witness to explain further if desired.

Mr. Shaw: I think the report said something about temporary relief. To what extent do you carry that?

Mr. Dyer: That is carried to the extent of providing transportation to the home or hospital. A physician is also called in while the person is lying in the drug store, and we pay that expense.

Mr. Shaw: That is the end of it?

Mr. Dyer: Yes, sir.

Mr. Shaw: What would you do in a case like this: We had a man who was fixing a belt, and by some means he got in the shafting and was severely injured about the head. The man was taken to the hotel by some of our men—no hospital in the place—and they have sent us in quite a bill—physician $60 and hotel $75. The man is recovering and will eventually get well. We had an assistant engineer who did not wait until his engine had turned over the last time and had his hand jammed, the wheel making only one part of a revolution, so that it was nearly stopped. He had three fingers amputated, and they want to know who is going to pay the expense of his medical care. We claimed that it was no fault of the company and there is no liability on our part. I had a talk with the representatives of the party and also with a physician and hotel keepers, and told them that we could not assume liability, as it might lead to further trouble.

Mr. Dyer: I should think the first thing to do would be to ascertain the law, whether or not there was any liability, before paying any charges. Of course, even if it was a case where we did not feel that we were legally responsible, there would often come up the question of charity, whether we should not give the men something, at the same time exacting a release, to release us from further liability. I would say that there is a great deal of money paid out year after year which we charge up to donations.

The session concluded with the presentation of the able report by Mr. H. L. Bettis, of Passaic, N. J., on "Standard System of Accounts," after which delegates dispersed to visit the large exhibition hall and note the many and varied displays. At 4 P. M., under the guidance of Mr. Joel Hurt, a visit was paid to the large power station of the Consolidated company, where much interest was shown in the interesting plant, recently described in the ELECTRICAL REVIEW.

In the evening the Capital City Club reception was participated in by all the visitors and enjoyed until a late hour, the ladies and gentlemen of Atlanta vying with each other in extending cordial welcome. President Mims delivered a brief address that met with instant and hearty response, and he was immediately promised a free ride on every street car line in the United States.

Thursday's Session.

An executive session was held on Thursday morning.

The subject of transfers and commutations was considered, the general impression being that the privileges should not be extended further than was absolutely necessary. The subject of the formation of a street railway mutual fire insurance company was also taken up, and, on motion of Mr. Russell B. Harrison, the incoming officers and Executive Committee were appointed a committee to report on the subject.

On motion of Mr. Littell, of New Orleans, Messrs. Littell, Perrine and Connette were appointed a committee to wait upon the officers of the Underwriters' Association of the South, with a view to securing better conditions and rates for insurance of street railway properties, the office of the association being in Atlanta.

On motion of Mr. McLean, the following gentlemen were appointed a committee to nominate officers and select place of next meeting; Messrs. McLean, Connette, McNamara, Baumhoff, Breed, Semmes and Rugg.

Letters of invitation for the association to hold its next meeting were presented from Cincinnati, O., Philadelphia, Pa., and Montreal, Canada.

On motion, adjourned.

MR. W. WORTH BEAN, OF ST. JOSEPH, MICH., FIRST VICE-PRESIDENT OF THE AMERICAN STREET RAILWAY ASSOCIATION.

Friday's Session.

President Payne called the meeting to order at 10.30 A.M. The first business was the report of the Committee on City and Suburban Electric Railways.

On motion the report was ordered to be printed in the proceedings.

The report on "The T Rail Construction of the Terre Haute Street Railway Company" was then read.

Mr. Seely: I would like to ask Mr. Harrison what is the cost of the T rail construction as compared with girder rail construction of the same weight?

Mr. Harrison: I could not give any comparison as to the same weight of rail because I never laid girder rail of that dimension. Our experience was with 38 and 45 pound girder rail and that was all taken up long ago.

Mr. Seely: Have you had any experience with the T rail outside of the brick and asphalt pavement; have you had any experience with granite blocks?

Mr. Harrison: No, sir; the brick pavement was much superior for smoothness and durablility than the granite blocks; but I am confident we can lay the rail as well and as successfully with the granite blocks as with the brick or asphalt pavement.

Mr. Seely: Do you not find that the concrete foundations are extremely rigid for the cars; that the wear takes place in the cars instead of the rail?

Mr. Harrison: The traffic is perfectly smooth and there is no jolting or jar; no oscillation with our cars. When the car comes to a rail joint you cannot tell that you are passing over it. Our track foreman has had long experience in steam railroad practice and he is instructed to spare no pains or expense in making the joints as solid and rigid as possible. I do that because I believe that after you once put a track in a paved street you do not want to repair the rail joint. You want to have it so that it will not give you any trouble and for that reason there is no money spared in laying the joints. The joints are laid as close as the natural expansion and contraction will permit.

Mr. Seely: The reason I bring up that point is that at the present time a great many railroads are being constructed where they are not allowing any space for contraction and expansion.

Mr. Harrison: My experience on that point is that there is so much of the metal down below the surface, where it is cool and so little of it exposed to the heat, just the head—we have no grooved rail or girder in our town—and just a little on one side exposed, that we do not suffer from contraction and expansion, as in the

(Continued on page 203.)

MAIL, EXPRESS AND FREIGHT SERVICE ON STREET RAILWAY CARS.

ABSTRACT OF A COMMITTEE REPORT TO THE AMERICAN STREET RAILWAY ASSOCIATION, ATLANTA, GA., OCTOBER 18, 1894, SUBMITTED BY RICHARD McCULLOCH.

In order to ascertain as well as possible how much has already been done, a circular asking for information in regard to mail, express and freight service was sent to every street railroad company in North America. Nine hundred and seventy-eight letters were sent out and 413 replies were received. These replies are tabulated below. As a great many railroads were not heard from, it cannot be assumed that the table is absolutely correct, but it is probable that most of the railroads having such a service answered the circular. Roads which are enumerated as having express or freight services are only those which have this service fully developed. The carrying of packages by conductors of passenger cars was not called express service, but is enumerated in a separate column. From some of the States, notably Pennsylvania, Rhode Island and Massachusetts, it was reported that the transportation of express and freight by street railroads was prohibited by State law, and many of the roads answered that their franchises allowed only the transportation of passengers.

The rate charged on express matter was usually five or ten cents per package, while the freight rates vary from four to ten cents per 100 pounds. The mail is usually carried either under a direct contract with the government or under a sub-contract with a mail contractor. The income from the transportation of the mails varies according to the amount of mail, the number of trips per day and the length of the haul, from $100 to $1,000 per annum.

TABLE OF MAIL, EXPRESS AND FREIGHT SERVICES IN NORTH AMERICA.

	Any Form of Such Service.	Under Contract with Express Co. or U. S. Gov't.	Haul Steam R. R. Freight Cars Over Street R. R. Tracks.	Operate Special Cars for this Service.	Carry Small Bundles on Passenger Cars for Pay.	Contemplate Such Service.	Distribute Matter Beyond Station.	Use Combination Express and Passenger Car.
Mail.....	62	58	.....	5	....	10	....	.. .
Express.....	35	8	.....	9	31	7	2	8
Freight.....	55	....	6	37	.. .	12	2	....

The only method of handling a large mail service, in which it is necessary to collect and distribute along the route, and handle it satisfactory both to the patrons of the road and the post office department, seems to be in the use of a separate car—an independent mail car in charge of a railway mail clerk. This system is already in use on street railroads in St. Louis, Brooklyn and several other places, and so far as we can learn is giving excellent satisfaction, both to the railway companies and the post office authorities. The mail is quickly and promptly handled; the service is regular and certain; great and small quantities of mail may be collected and distributed with equal facility; the residents along the line are greatly accommodated and no interruption or inconvenience to the passenger traffic need result.

As an example of such a service, it would probably be interesting to describe the operation of a United States mail car, which has been run by a street railway in St. Louis for some time. The St. Louis and Suburban Railway begins in the business part of the city and runs through the choicest residence and suburban settlements of the town of Florrissant, 16 miles from the center of the city. After leaving the city limits, the line penetrates the beautiful Florrissant valley, thickly dotted with pleasure resorts, country clubs, summer homes and suburban villas. The down-town portion of the road was formerly a cable and the suburban part a narrow gauge steam line, but with the onward march of Progress, the grip and the locomotive have gone to join the mule car and the road is now electric throughout its entire length. The mail car makes three trips each day, two through to Florrissant and one as far as the city limits. The railroad company furnishes a conductor and motorman, while the post office department supplies the mail clerks. The car, which was built especially for this purpose, is equipped with its own motors and is furnished with the necessary desks, cases, racks for mail bags, etc. At a schedule time it is run up in front of the post office and receives the mail put up in pouches from a wagon there to meet it. The mail clerk receives a bag for each station outside the city limits, and for each carrier along the route a bag designated by his number. He also receives all mail which has come in too late for assortment, which is distributed on the car to the proper bags before reaching the first station. Letters are received, canceled and distributed on this car, just as in the ordinary steam railway mail car. The first stop is at a point about one and one-half miles from the post office. At this point six carriers meet the car and each carrier receives from the mail clerk the pouch bearing his number. Another stop is made about two miles out, another two and one-half, another three, and another four miles from the post office. Any mail for the suburbs is handed to the mail clerk by the carriers and dropped into the proper bag by him. After the city limits are passed, bags are exchanged at each station just as on a steam railroad. On the return trip the same system is followed until the city limits are reached. Within the city, the post office department has placed letter boxes at the principal corners along the line. Each carrier brings the mail collected in his district to the nearest box on the line of the railroad. Stops being made at each box, the mail clerk removes the mail, and assorts it before arriving at the next station. The letters thus canceled and assorted are delivered at the main post office, tied up in bundles ready for shipment. The mail car makes no stops for passengers, and for this reason can easily keep out of the way of the passenger cars. A light freight business is also done on the car. Provisions, light furniture, milk, trunks, etc., are carried and the charges collected by the conductor. The mail service has now been in operation three years. New features are constantly being added to it, and aside from the accommodation afforded the residents of the territory through which the road runs, it is a source of profit to the railroad company.

The system just described seems the best that has yet been devised for the handling of a large mail business. Where the mere carriage of the mails in pouches from the main post office to branches, or from depots to post offices, is undertaken, and there is no attempt made at collection or distribution along the route, there can be no objection to carrying the mail sacks on the front platform, if their number is not too great; but passenger cars should not be stopped and held for mail collections, nor should valuable space within a passenger car be taken up with mail sacks.

There are many points in the street railroad, as now conducted, which make it almost an ideal agent for the transportation of packages and light freight. The great number of points reached by the cars, the absolute certainty with which they run, the thousand and one precautions taken against any stoppage of however short a duration, the rapidity with which distant points are reached and many other causes combine to make the street railroad of to-day a common carrier of exceptional advantages, when only short distances are considered. Many conditions will suggest themselves to railway managers in which an express or freight service may be made a paying institution. In the case of a town in which the railway station is some distance from the business part of the town, there can be no quicker, safer and better plan of conveying express and freight to some distributing point in the heart of the town than by the street railroad. Whether or not this will pay depends upon the amount of material, the competition, the distance and the scope of the street railway franchise. A case often met with through the country is that of two towns connected by an electric railroad, one of which, having no steam railroad, is obliged to get all its supplies through the other town. The installation of a freight service of some kind would at once suggest itself in this case, and the profits would depend upon the size of the towns, the character and occupations of the inhabitants, the distance between the towns, etc.

The operation of an express service on large city systems has not been attempted to any great extent, but it has been contended by some enthusiasts on the subject that a street car express service will eventually take the place of the many city deliveries and city express wagons now in use. As an example of a city road operating an express and freight service involving collection and a house to house delivery, it would be interesting to cite the case of the Southern Railway of St. Louis, which has been operating an express service on this plan for almost two years. The Southern Electric Railway begins in the heart of the city and runs in a southerly direction for seven miles, following the general direction of the river to Carondelet. The territory penetrated is thickly settled for almost the entire distance and in no essential does the road differ from the ordinary city street railway. Three trips per day are made upon schedule time by the express car, which is entirely independent, being mounted upon motors of its own. At the down-town end is a receiving station where a clerk receives all express consigned to the company and keeps all the books pertaining to the service. The especial feature of this service, however, is the collection and delivery. This is effected by means of wagons, two of which are kept at the down-town end of the road and three of which meet the car on all trips at certain points along the line. On receiving notice by mail, telephone, or otherwise, a wagon calls for a package, delivers it at the car, from which it is handed to the proper wagon and delivered to the address marked on the package. A charge of 10 cents per package is made for this delivery, and trunks are taken from houses to the Union depot, checked and the checks returned for the sum of 50 cents. A corresponding charge, according to size, is made for the delivery of large boxes and bundles. A compliment to the efficiency of the service is paid by the large dry goods and clothing houses, who have ceased to run their delivery wagons into this part of the city, and now consign all of their bundles to the railroad company. Where formerly one delivery daily was made by the wagons, three are now made by the railway. An interesting feature of the service is that several large factories, located in the southern part of the city, consign all their freight to the electric express. The goods are put on the car, taken to the proper railroad stations, shipped, and the bill of lading returned to the consignor. Packages are received by the express car C. O. D., the charges collected, credited to the proper account, and settlements made at the end of each month. The railway company assumes all the responsibilities of a common carrier, holding itself liable for all loss and damages. This, however, is a contingency which seldom occurs.

Up to this point we have considered an express and freight service merely as a paying or non-paying institution, to be adopted in the one case and to be rejected in the other. There is another view which may be taken of the case, however, which is in many instances the most proper solution of the problem. This is to regard the establishment of this service merely as an auxiliary to the passenger traffic, to be operated whether or not it pays in order to gain increased passenger travel. The most notable instances of this sort are the roads which run from the hearts of our large cities out into the suburbs. It is manifestly to the interest of these roads to promote building and settlement along their lines, and how can they better attract builders than by giving their patrons all the advantages of city life, not only in furnishing them with rapid transportation to and from the city, but in aiding them in receiving their provisions and supplies. This calls for some form of express service, and although the receipts from this source may not equal the expenses, the increased passenger receipts and the advertisement given the road must also be taken into account.

In closing, it would perhaps be well to note some of the principal points which, it is hoped, have been brought out in this paper:

1. That a mail service involving collection and distribution is best handled on a separate car, operated on the same plan as a United States railway mail car.

2. That it is supposed that a great advantage arising from the transportation of the mails comes from the fact that the road is under the protection of the government, and is thus secure from riots, strikes and blockades.

3. That the most promising opening for an express or freight service is a road running between two towns, or a city road running through well-populated suburbs.

4. That the question, whether or not such a service will pay is entirely a local question, and must be estimated for each road separately, under existing conditions.

5. That there are cases when it would be advisable to operate such a service, independent of the profits, in order to accommodate the patrons of the road and to induce building along the line of the road.

6. That such a service operated upon the ordinary street railroad must not be allowed to interfere in the least with the passenger traffic.

7. That in States having laws prohibiting this service, associations of railway managers should be formed to secure favorable legislation.

ELECTRICAL PROGRESS IN THE SOUTH.

OVER $100,000,000 INVESTED IN SOUTHERN ELECTRIC RAILWAY AND LIGHT COMPANIES.

A very interesting article on electrical development in the Southern States appears in the current issue of the *Manufacturers' Record*. A brief abstract of the article follows:

The greatest wealth creator which this age or any other has ever known is rapid transit in the shape of electric or cable railways. As to the amount of rapid railroad building which the South has accomplished within a few years, the city of Baltimore furnishes a most notable illustration. Three years ago every one of its street car lines was operated by horse power, with the exception of one mile of electric road in the northern part of the city. At present horses are used on but one road in the city limits and by 1895 this will be rebuilt for electric operation. Since the date mentioned about 220 miles of track have been laid in and near the city for cable and electric motive power, on which about 600 electric or cable cars are operated and which require the power generated in nine large stations. These figures will give merely an idea of the investment of capital in Baltimore alone in the street railroad business within three years.

But to show how generally Southern cities are provided with rapid transit facilities the *Record* prints a list of 62 cities, all of which have one or more electric lines.

In most of these cities the power plants, quality of roadbed and rolling stock will compare favorably with the systems in any of the municipalities in the country. Taking Atlanta for example, not a horse car is to be seen on its thoroughfares. The electric lines connect the business and manufacturing centers, hotels, railroad depots, theaters and churches with the principal residence sections in and beyond the city limits. On the Consolidated lines, which control 64 miles of track, the rolling stock is from the best makers in the country, such as the Pullman, Brill and Stephenson works, while Corliss engines of the most modern type furnish the generating power.

Next to Baltimore, the city of New Orleans, La., has been the scene of more electrical construction than any other point in the South. Fully 100 miles of track will be completed by the end of this year. As in Baltimore, animal power was used exclusively in the city up to two years ago, with the exception of one or two sections in the outskirts, on which steam dummies were operated. The New Orleans Traction Company, Canal and Claiborne company, New Orleans and Carrollton company, Orleans company and St. Charles Street Railway Company have all let contracts for electric equipment. These corporations combined own 150 miles of road. Two of the companies have lines now operated by motors. From January 1, 1893, to September 1, 1894, 391½ miles of electric railway were completed in Southern States. About 126 miles of electric railway is projected and under construction. The investment in these Southern rapid transit systems has found much favor in the North, and it is safe to say that over 50 per cent of the mileage has been built by outside capital. A few instances of these investments may be cited. At Baltimore the Elkins-Widener syndicate, of Philadelphia, controls the Baltimore Traction Company's roads. The Lake Roland Elevated system, 22 miles long, was the result largely of capital placed through the Jarvis-Conklin Mortgage Trust Company, of Kansas City. The president and one of the heaviest stockholders of the City and Suburban system is Nelson Perin, originally from the West. Murray Verner, the Pittsburgh street railway operator, is building one of the Norfolk electric lines. Boston capitalists hold most of the bonds issued by the Atlanta Consolidated Railway Company. The Jarvis-Conklin company practically built Augusta's railway. New York bankers are heavily interested in several of the New Orleans lines being supplied with rapid transit facilities.

Up to January 1, 1893, 296 electric power stations for motor and lighting purposes were built in the South by companies whose aggregate capital stock is $19,891,000. Since the time specified the *Manufacturers' Record* shows that 166 plants have been completed or are in course of construction. These include the station of the Brush Electric Light Company, which replaces one burned, and which is valued at over $1,000,000; also the station of the Baltimore & Ohio Railroad Company, for operating electric locomotives by the trolley system. These plants represent capital stock of fully $15,000,000, making a grand total of 461 stations controlled by companies capitalized at $35,000,000.

This is what the South has done in the adoption of electricity as one of the great factors in its progress.

OBITUARY.

The ELECTRICAL REVIEW regrets to learn of the death of Mr. Day K. Smith, president and general manager of the Calumet Construction Company, of Duluth, Minn.

F. A. Kirby, an electrician at one time associated with Professor Morse, the inventor of the telegraph, died suddenly of heart disease on October 16 at his home in Sayville, Long Island. He was born in London, England, and was at one time a member of the firm of Kirby & Griswold, of Lakeland. He was 79 years old.

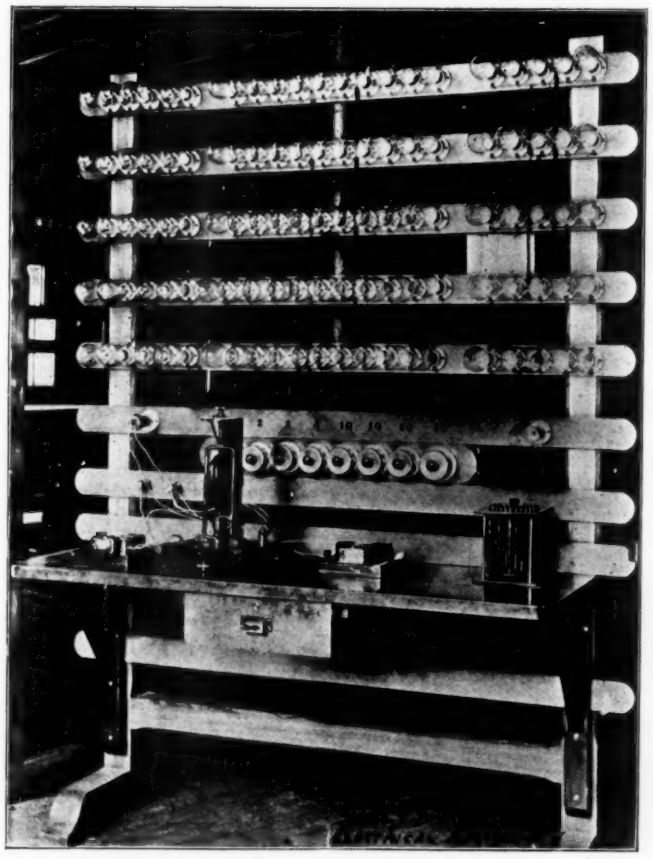


FIG. 1.—A CALIBRATING LAMP RACK.

A Calibrating Lamp Rack.

This rack of lamps was designed and constructed in the electrical laboratory of Armour Institute, Chicago, some time since, and its extended use has shown it to be a reliable and well-nigh indispensable accessory to the laboratory equipment. It was originally designed to furnish a current which could be readily and accurately varied within wide limits for the purpose of calibrating current measuring instruments. Since its construction it has been put to many and varied uses, such as furnishing current for electro-plating, operating small series motors, fall of potential measurements and similar cases in which an adjustable absorptive rheostat is needed.

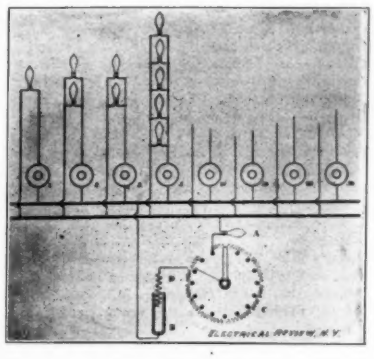


FIG. 2.—WIRING DIAGRAM OF CALIBRATING LAMP RACK.

When employed for calibrating purposes, it was designed to yield absolutely any current from .4 to 60 amperes. As seen in Fig. 1, there are one hundred 16 candle-power 110 volt incandescent lamps mounted on a skeleton switchboard. These were grouped in horizontal rows of five and ten merely for convenience in counting when lighted. They were wired, in all cases in parallel, in groups of 1, 2, 2, 5, 10, 10, 20 and 50. Each group was connected to a Bryant double pole switch. The numbers in the groups were proportioned after the fashion of a resistance box, so that any desired number of lamps, from one to 100, could be placed in circuit at will. Since this would enable the current to be varied only at intervals of .6 amperes, or the current of one lamp, an adjustable device was considered essential. As ammeters are usually calibrated, the actual reading on the scales is stated in comparison with that of a standard, and in almost every case this reading is fractional, rendering calculation necessary for the even scale readings. A more precise and convenient method is to bring the pointer to each even scale reading, and its real value can then be directly read off from the scale of the standard instrument and all tedious reduction calculations avoided.

The adjustable rheostat seen on the right of the table in Fig. 1 is to accomplish this end. A lamp, A, Fig. 2, is placed in multiple across the rack mains. A sliding contact enables the coils C, of approximately equal resistance, to be put in series with the lamp A at will, thus controlling the amount of current passing through A. To avoid the use of a great number of coils, the lamp A is 32 candle-power. With all the coils in series the current through A is reduced to .4 amperes, giving a range of control through .8 amperes. Since the current interval on the rack is .6 amperes, this arrangement is more than sufficient to regulate through the current intervals on the rack proper. Suppose a current of 47 amperes is desired. The nearest number of lamps to furnish this is 78. By pulling out the switches marked 50, 20, 5, 2 and 1, this number is lighted, but the current is only 46.8 amperes.

This last lamp can now be switched out, the current being 46.2, and the lamp A switched in, raising the current to 47.4, but by use of the rheostat this can be reduced to the desired current of 47 amperes. As there are 20 rheostat coils, the current variation is by .04 ampere steps. For all ordinary work this will yield a current sufficiently close to the value desired. When absolute accuracy is necessary the rack is operated from storage battery mains, and a supplementary coil D, Fig. 2, whose resistance is about 20 per cent greater than coil C, is switched into circuit. This coil is actuated by a sliding rod and dips into the mercury cup B. By raising or lowering this dipping coil, the resistance may be varied until absolutely the desired current is obtained. If greater capacity be needed, 52 volt lamps may be used, increasing its range from .4 to 125 amperes. Further, iron wire coils may be employed instead of lamps, giving any desired range, though in this case a simple absorptive rheostat might be cheaper.

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It was a highly successful convention.

Atlanta has again added to her laurels as a hospitable and progressive city.

The many people who were going to make fortunes out of the telephone field in the space of a few months seem to have gone to hibernating.

Telephone extension in Kansas is rapidly progressing. Edgerton, Gardner and Wellsville have just been equipped with offices connecting them on the metallic circuit between Olatha and Ottawa. The Missouri and Kansas Telephone Company is pushing out strongly in its territory.

It is reported that the Pennsylvania railroad has abandoned its projected line from Germantown, Pa., to the Trenton cut-off, owing to the building of a trolley line covering the same territory. The electric railway is rapidly becoming an important competitor of steam railroads in connection with local traffic.

New York city needs more electric street lights. It does not compare favorably with other smaller cities in the matter of its street and park lighting. In view of the police investigation now in progress, it may be well to remember the old adage that "an arc light is equal to one good policeman." And then, besides, the arc light has obvious advantages over a human cop.

A DESERVED COMPLIMENT.

We take pleasure in publishing in full below an extract from the report of the Executive Committee of the American Street Railway Association. It is so seldom that bodies of this kind take pains to give voice to their appreciation, even when so well deserved, that it is refreshing to be able to publish this action. There seems to be, in nearly every instance, an all-pervading fear that some less enterprising publication will be offended. The ELECTRICAL REVIEW has always been broad enough to appreciate merit on the part of its contemporaries and competitors, and is glad to thus prominently present the deserved recognition recorded below:

While we do not desire to make any particular distinction in our reference to the technical papers, we feel called upon to express our thanks to Mr. C. B. Fairchild, editor of the *Street Railway Journal*, for his personal efforts in the interests of the association in his contact with the street railway men of the country, and for the benefit conferred upon the fraternity in the production of the book entitled "Street Railways."

THE ATLANTA CONVENTION.

The Atlanta Street Railway Convention is a thing of the past. It is with a feeling of sincere pleasure that we review the events of that memorable meeting, unquestionably the most important in the history of the association.

In every particular it was a pronounced success, commercially, financially and socially, as well as in point of numbers.

The exhibits were numerous, interesting and well displayed and were in every way a credit to the various industries they represented. Thousands of dollars were spent in the accomplishment of this result, and they were well expended, giving practical demonstration of the tremendous strides electricity has made during the past four years as applied to street railway development.

The business meetings in convention hall were well attended, and the papers read and discussed were of vital interest.

Socially, no effort was spared to make the gathering a memorable one, and Atlanta's sons and daughters vied with each other in contributing to the entertainment of their guests. From the speech of welcome by Governor Northen at the opening of the convention on Wednesday morning, to the parting cheers which rang through the depot as the trains pulled out on Friday night, every moment not actually devoted to business was filled with social gayety.

The reception at the Capital City Club on Wednesday night was a magnificent affair and the spacious rooms were crowded with the representative men and fairest women of the city. The banquet at the Kimball House and the typical Georgia barbecue at Ponce de Leon Park were also events long to be remembered.

Atlanta is rapidly establishing her reputation as the "convention city of the South," and that this distinction is fairly won and will be nobly upheld all those who have been the recipients of her warm welcome and openhanded hospitality will gladly testify, and the street railway men most emphatically.

TWO OF THE VICE-PRESIDENTS.

Portraits of Messrs. W. Worth Bean, of St. Joseph, Mich., and Russell B. Harrison, of Terre Haute, Ind., first and third vice-presidents-elect, respectively, of the American Street Railway Association, are presented in this issue. The gentlemen are both active and progressive street railway men, early to adopt electricity and ever on the alert for improvements. They will prove efficient and valuable aids to President Hurt during the ensuing year.

Mr. Bean is a gentleman of remarkable energy and wide-awakeativeness, and Mr. Harrison, who is a son of ex-President Harrison, has always favored the highest grade of construction, and his road at Terre Haute, Ind., is pointed to as a model in this respect.

THE ATLANTA CONVENTION.

(Continued from page 199.)

case of a girder rail. The joints are the Wheeler joints and rest on the tie, and then we tamp the rail up with concrete, not only the ties supported by concrete, but under the rail also, and the concrete comes up over the

RUSSELL B. HARRISON, OF TERRE HAUTE, IND., THIRD VICE PRESIDENT OF THE AMERICAN STREET RAILWAY ASSOCIATION.

tie so that the rail and tie both rest on solid concrete with a heavy bed below, and when this brick paving is put on and all concreted together there are practically no joints, and you cannot feel them in passing over the rail. It gets no wear and tear, and that is why, in economy of operation, it is superior, because there are no joints to rattle a car in passing over them. Our motors and cars last longer and we have better service.

Telegrams were read from Thomas Lowry, president of the Twin City Railway Company, Minneapolis, and also from the commercial clubs of Minneapolis and St. Paul, inviting the association to hold its next meeting in the great convention city of the Northwest — Minneapolis. A letter from O. T. Crosby was read, regretting his inability, owing to pressure of business, to present a report on "Standards for Electric Street Railways." On a motion of Mr. Perrine, the Committee on Standards was continued.

M. K. Bowen, superintendent of the Chicago City Railway, recommended that a committee be appointed to investigate the subject of the validity of patented articles used by street railways. Mr. Perrine moved that a committee be appointed on this subject. Carried.

The matter of the proposed amendments to the constitution and by-laws, to provide for associate members, was then considered. An informal vote was taken as to the adoption of the amendments, and it was the unanimous judgment of the members that the amendments should be adopted. Action on the same will be taken at the next annual meeting.

The special committee appointed to interview the representatives of the Underwriters' Association of the South reported that they had been unsuccessful in their efforts.

Mr. Brophy, of Boston, representing the Mutual Insurance Association of New England, was introduced, and said: "I think it would be better for each State association of railways to make application to the board of underwriters of the mutual companies which controls its territory. I think something might be done in that way to secure a reduction. Our company is not a stock company. We have no agents and pay no premiums, so that we can afford to carry the business at somewhat lower rates. Ours is the only company at the present time which is carrying electric light and railway properties. We have been insuring electric light stations and power houses for two years, and car houses for one year. We have at the present time $7,000,000 of property of this class, and for the last 10 or 12 months, ending October, our losses have been $2,300 on those $7,000,000. We have been able to pay a dividend of 70 per cent on business written one year ago. We have been insuring this character of property for two years. I state this in order to show you that the electric business is not so hazardous as some people think it is. (Applause.)

Mr. Baumhoff: I would like to ask the gentleman in what cities his company carries insurance on electric railways; have you any district?

Mr. Brophy: We have no special district. Of course, the majority of our business is in New England, and the greater part of our insurance is on electric light property. We have seven millions on this class altogether and about five hundred thousand of that is on railway property. Our basis rate on brick power-houses is one per cent; frame, one and one-quarter; car house and contents, including cars, brick, one and one-quarter; frame, one and one-half per cent.

Mr. Baumhoff: Are you limited as to the amount?

Mr. Brophy: We cannot carry over $60,000 on any one building and contents. We are somewhat handicapped; our company is not large enough to carry the insurance the large companies would desire to place with us. We had an offer from a railway company recently to place $300,000, power house, car house and shops, and as they were practically one building we could not take it. Of course if they had formed three or four separate risks we might have done business. A mutual company will not take property exposed to a risk which it would not carry if it were offered. I think it might be well to appoint a committee to confer with some of the New England mutuals and see what they will do.

Mr. Harrison: I have had a satisfactory experience with the company Mr. Brophy represents, and I agree with the suggestion that it would be of interest and profit to the association to have a committee appointed. I move that a committee of five be appointed to take the matter up with the New England companies.

As far as our company is concerned we can get all the insurance we want from the company represented by Mr. Brophy; but larger companies could not do it. They would not carry so much in one risk; it would be necessary to deal with two or three to carry the full risk.

Mr. Seely: In relation to insurance companies the members of the National Electric Light Association had the same trouble you are laboring under, and I believe the company which Mr. Brophy represents came to their relief. I have no doubt that the street railway companies could get substantial relief in this direction by a conference with the representatives of the mutual companies. I think the committee should be appointed and set to work immediately. The Standard Oil Company carries its own insurance and has a profit every year, and there is no reason why this great business should not do likewise. We could establish a mutual company of our own and have a central office.

The motion to appoint the special committee was then put and carried.

The president appointed the following gentlemen: Messrs. Harrison, Terre Haute; Dyer, Augusta; Perrine, Trenton; Lusher, Montreal; Baumhoff, St. Louis.

Mr. Perrine offered the following:

Resolved, That the Executive Committee is hereby requested to take under consideration the question of the enlargement of the field and scope of the association and submit a plan suggesting ways and means therefor at the next meeting of the association.

The Nominating Committee presented the following report:

President, Joel Hurt, Atlanta, Ga.

First Vice-President, W. Worth Bean, St. Joseph, Mich.

Second Vice-President, Colonel John H. Cunningham, Boston, Mass.

Third Vice-President, Russell B. Harrison, Terre Haute, Ind.

Secretary and Treasurer, William J. Richardson, Brooklyn, N. Y.

Executive Committee, Henry C. Payne, Milwaukee, Wis.; W. H. Jackson, Nashville, Tenn.; D. G. Hamilton, St. Louis, Mo.; G. C. Cunningham, Montreal, Canada; J. N. Partridge, Brooklyn, N. Y.

The committee recommended Montreal, Canada, for the next meeting. On motion, Mr. Penington, of Chicago, was instructed to cast the ballot of the association for the officers nominated. This was done and they were declared duly elected.

Mr. Penington moved that Philadelphia be substituted for Montreal as the place of meeting.

A spirited discussion ensued on the question, and amid the calling of the roll there was much interest manifested. The vote when taken stood as follows: Montreal 38; Philadelphia 17.

COL. JOHN N. PARTRIDGE, OF BROOKLYN, NEW YORK MEMBER OF THE EXECUTIVE COMMITTEE OF THE AMERICAN STREET RAILWAY ASSOCIATION

Mr. Cunningham, of Montreal: I wish to say a few words to you to show how very pleased indeed I am

(Continued on page 206.)

THE USE OF THE BOOSTER ON ELECTRIC RAILWAY CIRCUITS.

SPECIAL PAPER READ BEFORE THE AMERICAN STREET RAILWAY ASSOCIATION, AT ATLANTA, GA., OCTOBER 18, 1894, BY J. H. VAIL AND S. H. WYNKOOP.

The question of investment in copper is one which has always been a bugbear to the street railway manager, and is to-day the most serious problem confronting the operating company, inasmuch as it tends to restrict the extension of long distance lines for serving suburban traffic. Since the cost of copper for a given service increases directly as the square of the distance, the necessary investment becomes prohibitory when the line extends more than three or four miles from the station.

Railway generators and motors are becoming more satisfactory; we are still allowed, in the absence of a conduit system inspiring confidence, to suspend our trolley wires overhead; and in some cities the authorities will look the other way while we string cables as large as hawsers from pole to pole, in pairs, in dozens, and, if poles could be found to stand the strain, probably in scores.

Even then we are not happy. The power house site is usually chosen, so far as circumstances will permit, with reference to convenient coal delivery and the distribution of traffic. In the heart of the city crowded streets render slow speed imperative; in the suburbs, where a clear track invites to rapid transit, the pressure is low, usually abominably so. In fact, the writers have in mind a city not far from the metropolis, where two motor cars are run upon a single car's time; and they have witnessed the fading out of the electric headlights as the two cars started out together. The reduced voltage was in this case self-evident; and the net horse-power secured to move the cars was probably less than half the proportionate amount originally generated in the station. The loss in transmission does not require further demonstration.

Accurate tests show that the commercial efficiency of the street railway motor at normal voltage is 78 per cent, while at two-thirds of the normal it is only 52 per cent. We all undoubtedly recognize the fact that the resultant effects of too little copper show up to the non-expert traveling public in slow speed and dimming of lamps; but to the railway company the results are actual losses—decreased traffic and increased coal bill—which is the direct opposite of what we desire. In other words, instead of aiming at the greatest receipts for the least expenditure, we are actually getting least receipts for greatest expenditure.

The usual remedy suggested is: Use more copper. Very good; but if the owners of the road are already groaning under the weight of the copper mine that has been saddled upon them, together with the cash invested therein—if they live in constant fear that they will be forced to place all feed wires in large cities underground, what then?

Leaving out of this discussion improvement in generating station, car equipment and track, we must look for higher economy to the alteration of our methods of electrical distribution, adopting such as will prove, after careful comparison, to be of least first cost, of reasonably high commercial efficiency, of interchangeability on different divisions of the system and of practically automatic action.

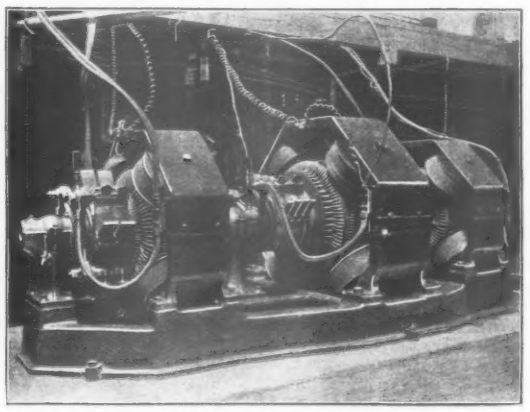
We are in need of a marked advance over present practice in this direction, and must devise some method of distribution that shall give better and more economical service over a large area, and which shall at the same time enable us to reach out from the power station to distances at present inaccessible.

The alternating current system, which has done so much to develop the distribution of electricity for lighting by incandescence, has not yet reached that stage of eminent perfection in motive power service which will warrant us in admitting its value for railway work at the present time.

Another method which might be suggested is one which contemplates the use of motor generators located at intervals along the line and actuated by high tension currents. Such a system must be automatic under all conditions of load and short circuits, working with cool bearings and not requiring careful attendance. This scheme also requires practical development.

The well-known booster system, invented by Mr. W. S. Barstow, and applied by him with great success to the feeders of constant potential electric lighting plants covering large areas, is worthy of our careful investigation, as it promises to offer a practical aid to the economic solution of what may be called the medium long distance electric railway problem.

With direct feeding we can overcome the loss in transmitting energy only by incurring the heavy cost of copper as a first investment. With the booster system, we overcome the loss in transmission by incurring the cost of operation of a machine which shall automatically raise the initial voltage above that of the bus bars by an amount which may exactly equal the drop in potential on the feeder at that instant.



"Booster" for Electric Railway Circuits.

When using this machine, we calculate our feeder for ampere capacity only, and constantly maintain the pressure at the service end of the feeder equal to the pressure at the bus bars, irrespective of the length of the feeder or the load.

In any given instance, the cost of a direct feeder increases the square of the distance, while the cost of the booster feeder is directly proportional to the number of miles. These characteristics of the latter system result in a reduction of first cost of from 25 to 75 per cent as compared with the first cost of the ordinary direct feeding methods of our present practice, and it thereby becomes possible for numerous electric street railway companies to extend their lines into suburban localities from 10 to 20 miles distant from the power station, at the same time retaining the investment within reasonable limits.

In order to present these matters in a manner easily comprehensible, we can readily establish equations for the two systems to be compared; and then, by assuming certain accepted values, plot the results. Let

C1 = Current delivered to trolley wire.

V = Voltage at generator.

V1 = Voltage at trolley wire.

V2 = Voltage of booster.

Eg = Efficiency of generating apparatus.

Eb = Efficiency of booster.

E1 = Operating expenses for direct feeding—coal, oil, water, waste, engineers, firemen and interest on so much of the steam generating and transmission plant as is due to the feeder under consideration.

E2 = Operating expenses for booster feeding—details as before.

M = Length of feeder in miles.

m = Circular mileage of feeder.

$ = Initial cost of as much of the steam generating and transmission plant as is due to the feeder under consideration.

I = Per cent interest on investment.

D = Per cent depreciation on investment.

s = Cost of steam plant per horse-power.

g = Cost of generating plant per kilowatt.

b = Cost of booster per kilowatt output.

k = Cost of insulated wire per pound.

p = Cost of placing 544 feet No. 4–0 wire, including insulators, pins, cross arms, sundry hardware and labor—5 per cent allowance for sag.

z = Cost of supplying one horse-power per year, in quantities of over 100 horse-power.

Then for direct feeding

$$\$ = \frac{\frac{C_1 V_1}{746} + \frac{C_1 (V-V_1)}{746}}{Eg} S + \left\{ \frac{C_1 V_1}{1000} + \frac{C_1 (V-V_1)}{1000} \right\} g + \frac{2315.488\ M^2\ C}{V-V_1} K + \frac{.5664\ M^2\ C}{V-V_1} p \qquad (I.)$$

And for booster feeding

$$\$ = \frac{\frac{C_1 V_1}{746} + \frac{C_1 (V-V_1)}{746} + \frac{\frac{C_1 V_2}{746}}{Eb}}{Eg} S + \left\{ \frac{C_1 V_1}{1000} + \frac{C_1 (V-V_1)}{1000} \left(\frac{\frac{C_1 V_2}{1000}}{Eb} \right) \right\} g + \frac{C_1 V_2}{1000} b + .019318\ m\ Mk + \frac{m\ M}{211600} p \qquad (II.)$$

Substitute the following values in Equation I:

C	= 200
V	= 500
V	= 550
S	= 45
Eg	= .95
g	= 25
K	= .13
p	= 75
b	= 50

We have

$$\$ = 9735 + 1374\ M^a. \qquad (III.)$$

Substitute the same values in Equation II, assuming 211600 as the value of m, taking Eb — .90, and finding an expression for V2 in terms of M, we get

$$\$ = 8732 + 2857\ M \qquad (IV.)$$

In order to graphically represent the relation between initial investments in the two methods of feeding under discussion, Equation I and II have been solved for varying values of M from 1 to 30, and the results plotted on Diagram I. An inspection of this diagram shows at once the immense superiority of the booster system over direct feeding in cases where first cost is the essential feature. It will be noted that the curves have been carried out for the entire 30 miles, without regard to the practical voltage limit in direct current machines, or the point at which the cost of operating an independent station becomes less than operating from the main station.

Diagram I shows that for distances greater than one and one-half miles it will cost less to install a booster system than to place copper and machinery in the usual manner for feeding direct. In cases where motive power is water, costing little or nothing per horse-power, these curves give at once the relative economy of the two methods; but ordinarily on account of the consumption of coal, the loss in the line (represented in the new method by the power required to operate the booster) becomes an important factor in the discussion; and it is necessary to establish equations for the operating expenses, taking into account the fixed charges of interest and depreciation on the investment, as well as the cost of furnishing the required power.

The following equations will enable us to determine these values for different distances:

Direct feeding:

$$E' = \frac{\frac{C_1 V_1}{746} + \frac{C_1 (V-V_1)}{746}}{Eg} Z + \$ (I + D) \qquad (V.)$$

$$E'' = \frac{\frac{C_1 V_1}{746} + \frac{C_1 (V-V_1)}{746} + \frac{\frac{C_1 V_2}{746}}{Eb}}{Eg} Z + \$ (I + D) \qquad (VI.)$$

Making the same substitutions in equation V and VI as were made in I and II, placing (I + D) = .10, and remembering that $ varies according to the method and distance under discussion, we get

$$E' = 155\ z + \frac{\$}{10} \qquad (VII.)$$

$$E'' = (139 + 36\ M)\ z + \frac{\$}{10} \qquad (VIII.)$$

Diagram II represents these equations plotted for varying values of M, being taken at 40.

The intersection of the upper curve with the upper straight line is the point at which the booster system costs as much to operate as does the direct system. This distance we find to be 12½ miles. For shorter distances, direct feeding is more economical, while for longer distances the booster system has an absolute advantage. Now, the assumption upon which equation V and VI were solved is a feeder constantly loaded to its maximum capacity. The absurdity of this assumption is apparent when one considers the actual conditions which obtain in railway work; the average load on the feeder during the entire year will be more nearly one-third or one-quarter of the maximum. We have, therefore, established and plotted equations similar to V and VI for three-quarter, one-half and one-quarter load, and the resultant

curves are shown on Diagram II, in order to afford ready means of comparison.

A careful study of these diagrams demonstrates in what the economy of the booster system consists. While

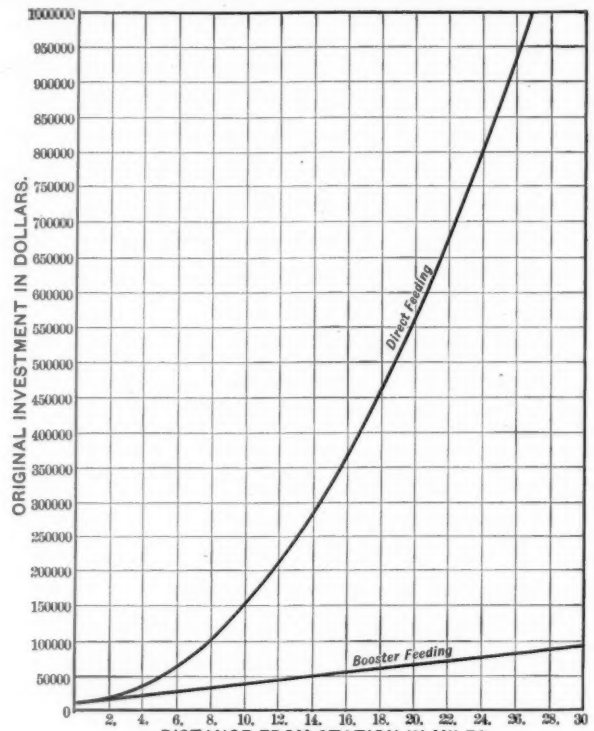


Diagram I.

the method we have outlined may seem like robbing Peter to pay Paul, it must be remembered that in direct feeding there is a large amount of capital invested in the pole line, accruing interest day and night, in storm and sunshine, irrespective of the traffic on the line; while with booster feeding the interest on copper investment is nominal, the power required to drive the booster itself being proportional to the load on the line. Thus we can readily understand why, under the conditions given, with an average load of one-quarter the maximum, the booster system is absolutely more economical than the direct feeding system for distances over four and one-half miles.

The equations here laid down will serve to answer any questions that may arise as to relative first cost or operating expense. It has been impossible to represent results derived under varying conditions without multiplying the diagrams indefinitely. All calculations have been based upon the most recent methods of rail bonding and track feeding, and the assumption that the resistance of the return circuit is equal to that of the outgoing circuit is, therefore, perfectly safe.

It may occur to some that the installation of a special high voltage generator to supply the feeder in question would be a simpler method of reducing the copper, but a cognizance of the enormous variations in drop under extreme changes in load, on a long feeder calculated for ampere capacity only, leads at once to the discarding of such a scheme until such time as manufacturers can

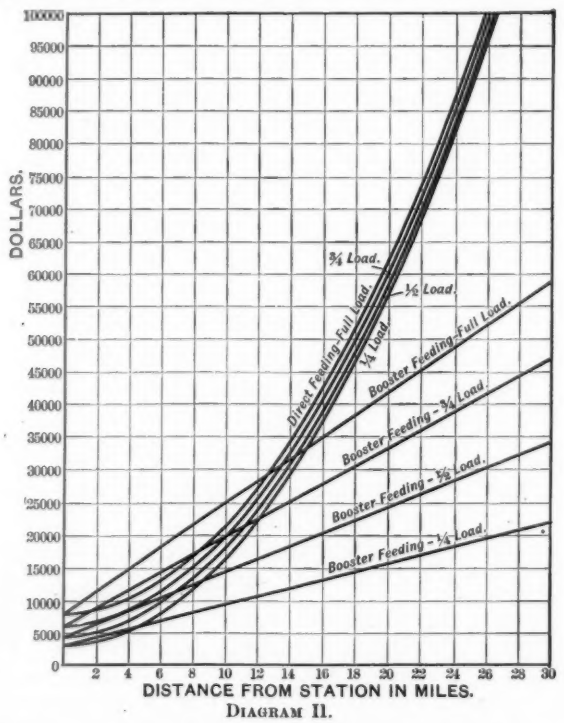


Diagram II.

furnish efficient generators overcompounded from 50 to 150 per cent.

The adaptability of the booster to railway work of all kinds is wonderful. A few specific instances are noted, in the confident belief that the suggestions thus thrown out will impel each and every electric railway manager to personally investigate this system, with a view to ascertaining exactly how far it would prove of advantage when applied to his particular road.

Ordinarily in calculating copper for distribution, we are obliged to allow for special features influencing traffic, such as ball grounds, race tracks, picnic groves, etc. As there is seldom any necessity for bunching cars at all these points simultaneously, and as the various features are usually scattered, it follows that at all times one or more of the feeders are lying comparatively idle. Under the plan suggested, the copper is figured for average conditions and a booster, placed in the station, is arranged to be thrown immediately upon any feeder which may become burdened with an excessive load.

Another feature of this system which makes for economy becomes prominent on long suburban lines forced to run an infrequent schedule late at night. On such a road the booster may be shut down and cut out of circuit entirely when the load on the long distance feeder drops to say one-quarter of the maximum, depending upon the amount of copper in the line.

If this suburban line extends to a park or pavilion which is open only during the Summer months, the advantage of the booster over direct

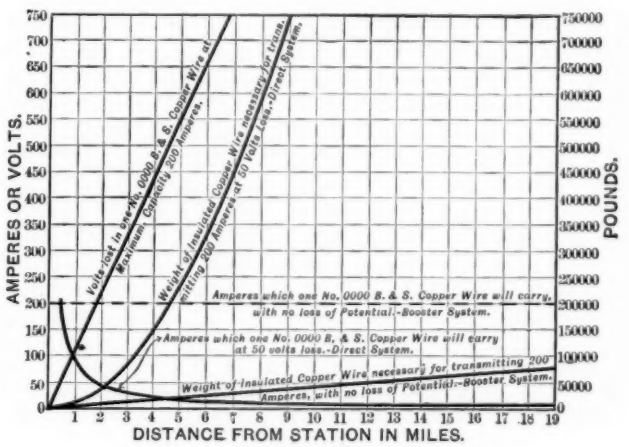

AMPERES OR VOLTS.
POUNDS.
DISTANCE FROM STATION IN MILES.
Volts lost in one No. 0000 B. & S. Copper Wire at Maximum Capacity 200 Amperes.
Weight of Insulated Copper Wire necessary for transmitting 200 Amperes at 50 Volts Loss.-Direct System.
Amperes which one No. 0000 B. & S. Copper Wire will carry with no loss of Potential.-Booster System.
Amperes which one No. 0000 B. & S. Copper Wire will carry at 50 volts loss.-Direct System.
Weight of Insulated Copper Wire necessary for transmitting 200 Amperes, with no loss of Potential.-Booster System.

Diagram III.

feeding is enormous, since the investment on a booster lying idle is a small fractional part of the interest on the idle copper of a direct feeder.

On many roads already in operation the copper in the line has proven entirely insufficient, and the erection of additional feeders is contemplated. Would it not be worth while to consider the installation of a booster at one-tenth the cost of the extra copper, provided calculations showed the economy of operating the two systems to be equal?

In the progress of electric railways, as in the growth of cities, development frequently fails to follow the lines predicted for it. It therefore happens that many a road to-day is worrying along, the victim of misplaced judgment—and copper. In many instances the adoption of a booster, and a redistribution of the present copper, will remedy the evil in the most economical manner.

In large cities, such as Boston, Brooklyn and Philadelphia, the tons of copper could in this way be largely reduced, with a gain at the same time in uniformity of pressure.

S. C. Whitney, of New Britain, Conn., has been appointed permanent receiver of the Norwalk and South Norwalk Electric Light Company.

ELECTRIC LIGHT FLASHES.

Lawrenceburg, Ky., has contracted for an electric light plant.

Utica, N. Y., is still lighted by towers surmounted by arc lights.

Work has commenced on the new electric light plant at Reedsburg, Wis.

Waupaca, Wis., has granted its electric light association a 20 year franchise.

Talk of the consolidation of the electric light plants of Des Moines, Ia., is again heard.

New Bedford, Mass., and Elizabeth, N. J., will put all overhead wires under ground.

Clifton Heights, Pa., will again be lighted with electricity, after a trial of two years with oil lamps.

Merrill Greely, president of the Plymouth, N. H., Electric Light Company, died on October 7, aged 62 years.

Frederick W. Mount, electrician of the gas and electric light company of St. John, N. B., last week shot himself through the heart, despondency having prompted the deed.

The Launceston, Tasmania, Gas Company, finding that "they would in the future have to compete against the electric light," have decided to reduce the salaries of their staff by 10 per cent.

Geo. F. Woolston has received the contract for lighting the city of Kingston, N. Y. The equipment for this plant will be purchased by Mr. Woolston at his office, 40 Wall street, New York city.

It is reported that Clarence D. Turney has been appointed receiver of the Consolidated Gas and Electric Light Company, of Westchester county, whose office is at Port Chester, N. Y., by Judge Dyckman.

Mayor McDonald has announced to the Austin, Tex., City Council that the city's water and light works would be ready for operating on December 1. Two hundred and fifty miles of wire, 15,000 incandescent and 200 arc lights will furnish the city with lights.

Six of Toronto's aldermen are alleged to be implicated in an attempt to extort money from the Toronto Electric Light Company, which put in a tender for a street lighting contract. It is said they demanded $12,000 for their votes. A thorough investigation will be made.

THE ATLANTA CONVENTION.

(*Continued from page 203.*)

to know that next year Montreal will receive this large and important association. I can assure you that we will do everything in our power to remove any difficulties that may exist as to entering any supplies for the purpose of exhibition. I can confidently promise you that there will be no difficulty in bringing in supplies to Montreal any more than there was in bringing them to Atlanta. We recognize in Montreal, as well as the residents of other places, that this exhibition, which is a part of the annual meetings, has become a very important feature and should be maintained and improved, if possible, every year; and, therefore, for that reason I can promise you that we will do all in our power to remove any difficulties that may exist in coming to Montreal. You will receive there a most warm and hearty welcome. (Applause.)

The report of the committee on "Mail, Express and Freight Service on Street Railway Cars" was then read by title only, and on motion was ordered to be printed in the proceedings.

The report of the committee on "Transfers and Commutation" was read by title and ordered to be printed in the minutes.

The report of the committee on "The Use of the Booster on Electric Railway Circuits," after a few remarks, giving the substance of the report, was ordered to be printed in the proceedings.

Messrs. Dunlop, of Washington, and McNamara, of Albany, were appointed a committee to escort the newly elected president to the chair.

Mr. Payne introduced Mr. Hurt, who said: "Mr. President and gentlemen of the convention, I thank you sincerely for this honor. I have not sought it, but I appreciate it none the less. I assure you that I shall not take up your time in making a speech. I am fully in accord with those who have the interests of this association at heart, and I shall endeavor to do my best during the year to come to further its advancement. I can do no more than ask your co-operation, free consultation and help in every direction. The Executive Committee, of course, will have certain important matters before them: but with your secretary must lie the main weight, and I have no doubt that he will in the future, as he has in the past, discharge his full duty.

I feel that this Association is entering upon an era of much more useful work than has marked its past career. Its scope should be enlarged. There are many features of the work devolving upon the managers of street railways, in which they need help from this association; and this question should have your special attention during the next 12 months.

I can only promise you that my feeble effort will be given with the greatest earnestness whenever I see it can be of any avail. Thanking you again, gentlemen, for the honor, I wish you all God speed, and hope that we will meet again in another year and have quite as full an attendance as we have had here." (Applause.)

On motion of Mr. Perrine a vote of thanks was passed to the retiring officers, the Atlantic Consolidated Street Railway Company, the Capital City Club, the local press and the citizens of the city of Atlanta generally, for courtesies, kindness and attention and generous hospitality which had been extended to the association.

The report on "Destructive Arcing of Five Hundred Volt Fuses" was read by title only and ordered to be printed in the proceedings.

The paper on "Brake Shoes" was read by its title only and was ordered to be printed in the proceedings.

Mr. Davis: In accordance with the recommendation of the author of the paper I move that a committee be appointed, to consist of two members of the association, and one manufacturer, to investigate the subject of the adoption of a standard style of brake shoes, conduct experiments, and to report the data collected and its conclusions at the next meeting, without expense to the Association. Carried.

The report on "Power Brakes *vs.* Hand Brakes," by E. J. Wessels, was read by title only. It was ordered to be printed in the proceedings.

Mr. E. A. Sperry: The paper just read by title contains a reference to a paper read by me before the American Institute of Electrical Engineers last month. The reference being somewhat unjust, I would like the opportunity of showing wherein such errors have occured.

One point should receive explanation, namely, that of holding a car on a grade after it has been brought to rest. On the car in operation at this convention I could easily show you a portion of the apparatus which is used to hold the car on grades, but which, on advice of counsel, has been removed from the wheels, and cannot be shown publicly until December 15. I might say that by means of this device the single handle by which the car is first started may, by swinging around, bring the car to rest by use of the electric brake; and by the simple act of holding this handle in the position where the brake is fully applied or fully on, the motorman is enabled to hold a heavily loaded car on an eight per cent grade. The hold is perfect and remains so as long as the handle is held in this position, and it does not require energy to hold it in this position. We find one fact which greatly aids this process, namely, the friction of quiesence, that is, the natural resistance of any mass to start to move when once brought to rest. I most heartily agree with the author as to the necessity of proper brakes, but think the highest order of engineering should be employed.

The special paper by Allen R. Foote on "Taxation" was then read by title and ordered to be printed in the minutes.

The convention then adjourned.

A delegation of Bergen street property owners last week called on Mayor Schieren, of Brooklyn, N. Y., to protest against the trolley on that street. They wanted it reformed in four particulars, as follows:

Speed reduced 50 per cent.

Trolley signal poles taken down, because they are not pretty.

The custom of lining up cars on the street near the barns for blocks prohibited.

The rapid going over crossings stopped.

If these reforms are adopted, they say, they can sleep. Mayor Schieren referred the matter to Corporation Counsel McDonald.

Electrical engineering and foot-ball don't seem to go well together at Cornell University. Last week Billy Ohl, the full back, of whom so much has been expected, and who is considered the strongest man on the Cornell eleven, appeared on the field and announced that he had retired from foot-ball for good. He is taking a course in electrical engineering, and this course demands much time. The faculty is exceedingly strict as regards complete work, and Ohl has had to take his choice between closer study and foot-ball.

NEW YORK ELECTRICAL SOCIETY

INSPECTS AN ELECTROLYZING PLANT.

The New York Electrical Society had a perfect Fall day for its trip to Riker's Island to inspect the electrolyzing plant by which the fluid used in garbage disinfection is manufactured. On the afternoon of the 11th instant about 100 people boarded the tug at Thirty-third street. The gathering was thoroughly representative, including a number of the leading medical men, chemists and scientific and sanitary experts of the city. The programme was to steam direct to Riker's, see what had been done, inspect the plant and hear what Dr. Woolf, the able pioneer in the great new sanitary work of electro-disinfection, had to say about it. If time allowed, a sail up the Sound was then to have been taken, and the boat was to return to the home wharf at 5.30, calling at One Hundred and Thirty-eighth street and Seventy-ninth street for the convenience of up-town passengers. When the visitors, however, reached Riker's, they found more than enough to interest them for the rest of the afternoon. They soon realized that the island is now a very different place from the seething and pestilential accumulation of putrid filth that during the Summer months filled the air for miles with a stench like the breath of a Gila monster. The place was sweet. Rows of deep holes had been dug for the reception of the disinfecting fluid, so that the underlying layers of refuse, 10 and 12 feet below, could be more thoroughly saturated.

Out of some of these newly excavated holes came a faint odor; it had none of the old Riker's "bouquet," but a damp, earthy tinge, with no suggestion of decomposition. At once the full meaning of the work the visitors had come to investigate became apparent. Here were 30 acres of dumping ground, on which the garbage output of New York for months had been discharged, before the city authorities awoke to the fact that they had organized and put into active operation an appalling menace to the health and even the life of a large section of a thickly populated district. The rotting mass was lying 15 and 20 feet thick in places, and it seemed impossible that any known method of disinfection could cope with such a huge caldron of putrefaction. At many points the fermentation was so advanced that smoke curled up incessantly, and an egg could be cooked anywhere a few inches down. Dr. Woolf, whose work at Brewsters is so well and favorably known, was called in, and the result was the erection of a temporary electrozone plant, capable of delivering about 4,000 gallons an hour, and on June 29 the work of the sterilization and purification of the island began.

As it was subsequently decided to continue the dumping at Riker's Island, a permanent plant was erected of two 100 horse-power boilers, two 75 horse-power engines and three 100 ampere dynamos at 16 volts. Each vat gives on an average an hourly supply of 2,000 gallons. The flow of sea water, which runs into the electrolyzing vats, is ingeniously regulated by an automatic device, which keeps it at a uniform height on the electrodes. Each of the distribution pipes connected with the tubs is insulated by the introduction of a piece of rubber hose. This effectually prevents the leakage that might otherwise take place from one tub to another through the iron piping. The strength of the disinfectant varies between 30 and 45 grains of available chlorine in hypochlorite to the gallon, and there is practically no loss in the distribution, for the liquid is drawn off the instant it leaves the electrodes. It is carried by a discharge pipe direct to the hoses, by which a stream is directed on any desired point. Dr. Woolf gave a lucid explanation of the process, and was plied with a succession of questions by his critical and interested audience. Commissioner Andrews in a few words expressed a hearty recognition of the labors of Dr. Woolf, and the unqualified success of his operations at Riker's.

Mr. Andrews stated as a possibility of the near future, that in view of the cheapness of the production of electrozone it may be used for the slucing and cleansing of the city streets. So convinced was he of the adaptibility of the system to the effective handling of the city refuse, that he had asked for an appropriation for the erection of small plants at all the garbage collecting stations of the city.

Refreshments were generously provided on the island, and the hospitality of Dr. Woolf resulted, quite undesignedly, in his receiving a most sincere and flattering compliment. If the phenomenal celerity of the disappearance of the eatables and drinkables goes for anything, the purity and salubrity of the air of the Riker's Island of to-day is beyond question.

A brief business meeting of the society was held on board the boat, and nine new members were elected. The membership list continues its steady increase, and it is expected will pass the 400 mark before the end of the season.

Col. John N. Partridge, Executive Committee American Street Railway Association.

Col. John N. Partridge is one of the prominent citizens of Brooklyn, N. Y., having been at different times Fire Commissioner and Police Commissioner of that city, offices which he filled with the highest honor and satisfaction. Since retiring from the Police Commissionership several years ago, Col. Partridge has been identified with large street railway interests of Brooklyn, and is now president of the Brooklyn City and Newtown Railroad, which controls the extensive De Kalb avenue trolley line and other roads. The De Kalb avenue line has the reputation of being one of the best conducted electric roads in the city, and is a prosperous and popular traction railway. Col. Partridge was one of the first in the city of Brooklyn to use the trolley system. His fine executive ability and kindly nature has caused his name to be mentioned often for political honors in the city of Brooklyn, but with the exception of the offices named above he has so far declined to enter the political field. The Colonel is an ex-officer of the civil war, and was for a number of years colonel of the 23d Regiment of New York State, a regiment that was said to be the best drilled in the militia of any State in the Union. His portrait appears in this issue.

The staff of *Dixie* extended numerous courtesies to the visiting newspaper men.

P. M. Kling, manager of the St. Louis Car Company, came in from St. Louis and renewed many former acquaintances. Mr. Kling stated that the rumor that the car manufacturing companies of St. Louis were to consolidate was unfounded.

THE ATTENDANCE.

Following is a complete list of the delegates in attendance upon the convention. The delegates, with the cities and companies which they represent, are as follows:

Atlanta, Ga.—Atlanta Consolidated Street Car Co., Walker Glenn, J. B. McCrary, Faunt Rice, W. H. Glenn, E. Woodruff, H. E. W. Palmer, Joel Hurt, Henry Jackson N. W. L. Brown, Dr. C. D. Hunt; Georgia Electric Light Co., H. T. Edgar; Atlanta and Chattahoochee River Railroad Co., J. F. W. Darr, J. T. Adams, W. S. Larendon; Atlanta Traction Co., W. L. Seddon.
Augusta, Ga.—Augusta Railway Co., D. B. Dyer.
Aurora, Ill.—Aurora Street Railroad Co., D. A. Belden, L. E. Myers.
Albany, N. Y.—Albany Railway Co., J. McCredie, John McManara.
Baltimore, Md.—City and Suburban Railroad Co., S. B. Thompson, J. F. Heyward, Frank H. Sloan.
Birmingham, Ala.—Birmingham Railway and Electric Co., J. A. Stratton, J. B. McClary, E. Tarris.
Bay City, Mich.—Bay City Railroad Co., C. O. Rush; A. A. Railroad Co., B. F. Hendrickson.
Brooklyn, N. Y.—Brooklyn City and Newtown Railway, J. N. Partridge.
Bloomington, Ill.—Bloomington City Railroad Co., W. H. Patterson.
Boston, Mass.—West End Street Railroad Co., C. S. Sargent.
Brooklyn, N. Y.—Steinway System, W. H. Linburg.
Columbia, S. C.—Columbia Electric Railroad Co., J. Q. Marshall, Alfred Wallace.
Chicago, Ill.—West Chicago Street Railway, P. M. Dyer; Calumet Electric Street Railway, H. B. White; Chicago City Railroad Co., T. C. Pennington, R. L. Garth.
Cincinnati, O.—C. M. and D. Railroad, H. B. Morehead, O. B. Brown, W. P. Noble; Cincinnati Incline Plane Railroad, J. A. Smith, H. P. Bradford; Sperry Electric Railroad, J. B. Linn.
Cleveland, O.—Cleveland City Railroad, C. W. Wason, J. Koche.
Camden, N.J.—Camden Horse Railroad Co., W. E. Harrington.
Charleston, S. C.—Enterprise Railroad Co., T. W. Passailaigue.
Decatur, Ill.—City Electric Railroad Co., W. L. Ferguson.
Cincinnati, O.—Cincinnati, Newport and Covington Railroad, T. W. Jenkins, J. McCredie; Cincinnati Street Railway, P. Leen.
Camden, N. J.—C. G. and W. Railroad, Henry McCallister, J. W. Morgan.
Dallas, Texas.—Queen City Railroad, R. S. Wakefield.
Covington, Ky.—South Covington and Cincinnati Railroad, T. W. Jenkins, J. McRedie.
Carbondale, Pa.—Carbondale and Forest City Railroad, J. W. Aitken, D. J. Duncan.
De Moines, Ia.—Des Moines City Railroad, G. B. Hupple.
Dayton, O.—Wayne Street Railway, E. Bridges.
Easton, Pa.—Easton Transit Co., H. Rink, J. S. Rodenburg, A. W. Chidsey, W. M. Williams, J. V. Bull, F. H. Knight.
Fall River, Mass.—Globe Street Railway, R. S. Goff.
Galveston, Tex.—Galveston City Railroad, W. H. Sinclair, T. K. Wrie.
Gainesville, Ja.—Gainesville Hall Street Railway, D. E. Evans.
Grand Rapids, Mich.—Consolidated Street Railroad Co., G. S. Johnson.
Hazleton, Pa.—Lehigh Traction Co., C. A. B. Hank, A. Markle.
Harrisburg, Pa.—E. H. Burg Passenger Railway Co., F. B. Musser.
Haverhill, Mass.—Haverhill and A. Railroad, E. P. Shaw, J. W. Cunningham.
Houston, Tex.—Houston City Street Railroad, C. A. McKinney.
Hamilton, Ont.—Hamilton Street Railroad Co., J. B. Griffin.
Hartford, Conn.—E. S. Goodrich.
Johnson City, Tenn.—Johnson City and Carnegie Street Railroad, E. H. Stevens.
Jamestown, N. Y.—Jamestown Street Railroad, G. E. Wattby.
Kalamazoo, Mich.—Citizens' Street Railroad, T. P. Bailey, G. J. Kobusch, J. W. Johns.
Knoxville, Tenn.—West End Street Railroad, R. M. Khea, L. D. Tyson.
Lexington, Ky.—Passenger and Belt Railway, E. J. Richards.
Louisville, Ky.—Louisville Railway Company, E. J. Minday.
Lowell, Mass.—Lowell and Suburban Street Railroad, P. F. Sullivan.
Lawrence, Mass.—Lowell, Lawrence and Haverhill Railway, C. S. Clark.
Lacrosse, Wis.—Lacrosse Street Railroad, B. G. Smith.
Lincoln, Neb.—Fitzcold Vandorm Company, H. T. Van Dorm.
Macon, Ga.—Macon and Indian Springs Railway, J. H. Herty, J. T. Wylan.
Mansfield, O.—Card Electric Railway, J. F. Card.
Manchester, Conn.—The Mather Electric Co., T. C. Perkins.
Milwaukee, Wis.—Milwaukee Street Railway, C. D. Hayden.
Mansfield, O.—Citizens' Street Railway, Reid Carpenter.
Memphis, Tenn.—Citizens' Street Railway, J. G. Jones.
Milwaukee, Wis.—Milwaukee Street Railway, C. L. Jones, W. H. Cameron, H. C. Payne
Brockton, Mass.—Brockton Street Railway, A. F. Glasier, W. L. Henry.
Gloucester, Mass.—Gloucester Street Railway, D. J. Ford.
Mobile, Ala.—Mobile Street Railway, R. Semmes.
Montreal, Can.—Montreal Street Railway, G. C. Cunningham.
Manchester, N. H.—Manchester Street Railway, C. H. Williams, C. H. Bartlett, J. H. Bickford.
Montgomery, Ala.—Montgomery Street Railway, E. L. Coolihan, R. F. Scott.
New York, N. Y.—Metropolitan Street Railway, A. C. Tullie.
New Britain, Conn.—Central Railway and Electric Co., E. S. Breed.
New York.—National Electric Light Association, G. F. Porter; Dry Dock, East Broadway and Battery Railway, E. T. Landen.
New Haven, Conn.—Winchester Avenue Railway, A. E. Pond, E. P. Shaw.
New Orleans, La.—New Orleans Traction Co., W. Nelson Smith; Orleans Railroad Co., P. Cougot.
Nashville, Tenn.—Nashville Traction Co., F. W. Hunter; Nashville Street Railway Co., E. G. Connette.
Newport, R. I.—Newport Street Railway, A. C. Titus.
Elmira, N. Y.—West Side Railway, W. W. Cole.
Nashville, Tenn.—Nashville Street Railway, F. W. Ewing.
New Bedford, Mass.—Union Street Railway Co., S. S. Wendell.
New Haven, Conn.—New Haven Street Railway, G. A. W. Dodge.
Nashville, Tenn.—Union Power Co., H. H. Corson.
Omaha, Neb.—Omaha Street Railway, W. A. Smith; O. & C. R. R. & B. Co., W. S. Dimmock.
Youngstown, O.—Youngstown Street Railway, W. Howard.
Poughkeepsie, N. Y.—Poughkeepsie Street Railway, J. H. Vail.
Phillipsburg, Pa.—Clearfield Traction Co., C. A. Brang.
Pittsburgh, Pa.—Pittsburgh Traction Co., W. L. Elikins; Citizens' Traction Co., J. E. Rugg.
Plymouth, Mass.—Plymouth and Kingston Railway, C. E. Barnes.
Piqua, O.—Miami Valley Railway, A. M. Orr, L. M. Fliak, F. C. Davies.
Philadelphia, Pa.—New Electric Railway, George Lodge, J. F. McLaughlin, F. J. Ehrnan.
Peoria, Ill.—Central Railway, C. E. Flynn.
Quincy, Ill.—Quincy Horse Railway, E. K. Stone.
Rochester, N. Y.—Rochester Street Railway, A. Green, S. A. Williams, J. H. Stedman.
St. Louis, Mo.—People's Railway, Charles Green, A. B. Ewing, Dan Mahoney.
Savannah, Ga.—Electric Railway of Savannah, J. W. McFarland.
Shamokin, Pa.—Shamokin and Mount Carmel Railway, H. J. Crowley.
Asbury Park, N. J.—Seashore Electric Railway, W. H. Shaffel.
Springfield, O.—Springfield Railway, W. B. McKinley, R. S. Hunter, W. S. Hood, S. L. Nelson, C. E. Miley, A. S. Krotz.
St. Louis, Mo.—Missouri Railroad Co., A. C. Thompson; St. Louis Railway, D. G. Hamilton, R. McCollough, Richard McCollough; Southern Electric Railway, J. P. Allen; Union Depot Railway Co., C. H. Pierson; Lindell Railway Co., J. Adkin, J. W. Baumhoff.
Salt Lake City, Utah.—Salt Lake City Railway, W. P. Reed.
Steelton, Pa.—M. T. H. and S. M. D. Pratt.
Terre Haute, Ind.—Terre Haute Electric Railway, M. F. Burke, Russell B. Harrison.
Toledo, O.—Toledo Consolidated Railway, C. L. Wight, W. S. Jewell.
Taunton, Mass.—Taunton Railway Company, G. F. Seibell, G. C. Moore.
Troy, N. Y.—Troy City Railway Company, C. H. Smith.
Trenton, N. J.—Trenton City Railroad, R. Woodruff.
Worcester, Mass.—Worcester Consolidated Railway, C. B. Pratt, J. N. Akannan, C. J. Falk.
Washington, D. C.—Washington and Georgetown Railway, G. F. Dunlop, J. G. Parke; Cable Railroad, Robert Beal; Columbia Railway Company, R. F. Baker and O. C. Gillee.
Webb City, Mo.—Southwest Missouri Electric Railway, E. J. Pratt.
Wilkesbarre, Pa.—Wilkesbarre Traction Company, W. G. End, J. Graham, J. C. Meixell, J. Fagan, J. W. Hollenback.
Wakefield, Mass.—Wakefield and Stoneham Railway, C. F. Woodward.
Winnepeg, Mass.—Winnepeg Electric Railway, H. J. Somerset.
Williamsport, Pa.—Williamsport Passenger Railway; E. H. Davis.
Worcester, Mass.—Worcester, Lancaster and Spencer Railway, W. B. Ferguson.
Utica, N. Y.—Utica Railway Co., G. W. Helle.
J. E. Crossman, official stenographer, Brooklyn, N. Y.

The following is a list of the representatives of allied interests:

American Car Co.—E. J. Ladless, St. Louis, Mo.
American Railway Supply Co.—Walter Chur, New York.
Adams & Westlake Co.—George A. Crisson; Chicago, L. A. Gray.
Anniston Cordage Co.—F. W. Jones, Anniston, Ala.
American Iron and Bolt Co.—G. M. Ball, Cincinnati.
A. and B. Manufacturing Co.—New York.
American Electric Manufacturing Co.—J. F. Gerliman, St. Louis.
Abendroth & Root Manufacturing Co.—P. M. Laren, general manager, New York.
American Engineering Co.—C. H. Williams, G. Mays Ball, Atlanta, Ga.
Berlin Iron Bridge Co.—J. M. Field, East Berlin, Conn.
Bragg Fender Co.—F. A. Bragg, general manager, Troy, New York.
Geo. C. Ball & Co.—S. Mays Ball, Birmingham and Atlanta.
Brunner Brick Filler Co.—H. C. Brunner, Pontiac, Ill.
Brownnell Car Co.—W. B. Allen, St. Louis, Mo.
Binghamton Wagon Co.—J. H. McConathy, Binghamton, N. Y.
Bushnell Manufacturing Co.—E. M. Bushnell, Easton, Pa.
W. R. Brixey.—F. G. Fuller, New York.
J. G. Brill Co.—S. M. Curran, W. E. Curver, W. H. Heuling, G. M. Haskell, T. C. Randall, Philadelphia.
Barney & Smith Co.—A. M. Kittridge, superintendent; J. H. Hopkins, Dayton, O.
Brooklyn Car, Wood and Veneer Co.—W. B. Lebaw, Jr., Brooklyn N. Y.
Mark D. Batcheldor Co.—M. D. Batcheldor, Atlanta, Ga.
Bass Foundry and Machine Works.—P. F. Lilack, Fort Wayne, Ind.
E. T. Burrows Co.—J. W. Burke, Portland Me.
H. and B. Manufacturing Co.—E. M. Oswald, New York.
Buckeye Engine Co.—G. A. Barnard, Salem, O.
Carnegie Steel Co.—W. M. Kelly, Atlanta, Ga.
Chicago Electric Truck Co.—G. H. Graham, Chicago.
G. L. Colgate Co.—G. L. Colgate, New York.
Conn. Car Heating Co.—J. R. McCloy, Albany, N. Y.; Edwin A. Smith, H. N. Ransom, F. B. Waudegus.
The Car.—F. B. Vandegrift, J. W. Nagle, Philadelphia.
R. A. Crawford Manufacturing Co.—R. A. Crawford, Pittsburgh.
C. L. Cornell, Hamilton, O.
Composite Brake Shoe Co.—G. C. Ervine, Boston.
Chapman Valve Manufacturing Co.—E. L. Ross, E. W. Buss, Indian Orchard, Mass.
Car Equipment Co.—E. H. Allen, Philadelphia.
The Creaghead Engineering Co.—G. E. Scrugham, Cincinnati.
Central Electric Heating Co.—E. A. W. Wyman, R. S. Jerome, Sidney Hoch, New York.
Columbia Incandescent Lamp Co.—J. H. Rhotehamel, St. Louis, president.
Cutter Electric and Manufacturing Co.—C. E. Bibber, Philadelphia.
Central Brass Co.—T. C. White, St. Louis.
The Dixie.—J. H. Allen, Atlanta, Ga.
C. J. S. Dimock.
Dedericks Dual Car Fender.—Levi Dederick, G. Poe, Albany.
Davis Car Shade Co.—C. M. Fuller, L. P. Hills, Portland, Me.
Dayton Manufacturing Co.—P. L. Lidenger, Dayton, O.
Dorner & Dutton Manufacturing Co.—J. L. Pugh Cleveland, O.
Dreher Manufacturing Co.—H. H. Foster, New York.
Electric Power.—H. M. Davis, H. A. Foster, New York.
J. M. Emerson & Son.—C. S. Lyle, New York.
Electrical Engineer.—T. C. Martin, New York.
E. & M. Engraving Co.—W. H. Borme, New York.
Electric Publishing Co.—E. L. Powers, Chicago, Ill.
Electrical Review.—C. W. Price, New York, H. G. Tuckerman, Boston.
Electric Railway Equipment Co.—S. J. Nick, Cincinnati.
Fairburn Engineering Co.—I. M. Cobbs, Chicago, Ill.
Fulton Truck and Foundry Co.—W. E. Hayson Rogers, Mansfield, O.
Flood & Conklin Co.—H. C. Kuhrt & Dick, Newark, N. J.
H. Fall Manufacturing Co.—A. Hoffman, Milwaukee, Wis.
A. French Spring Co.—P. T. French, Pittsburgh, Pa.
General Electric Co., New York.—W. J. Clark, George Rosenthal, F. M. Kimball, A. F. Giles, C. T. Conn, A. K. Baylor, G. W. Trawick, T. P. Bailey, H. C. Gait.
Genett Air Brake Co., New York.—E. J. Wessells.
E. S. Greeley Co., New York.—F. A. Magee.
John A. Graham & Co., New York.—C. A. Hoagland.
Georgia Equipment Co., Atlanta.—J. Regenstein, W. Brooks, C. E. Fairbanks.
Hale & Kilburn Co.—C. E. Barrett, B. F. Pilson, Philadelphia.
Hughes Fare Register Co.—E. Pecker, New York.
Hoopes Manufacturing Co.—W. H. Fisher, Springfield, O.
Heins Safety Boiler Co.—E. D. Meier, St. Louis.
Hoopes & Townsend.—F. R. Case, Philadelphia.
International Register Co.—A. H. England, Chicago.
H. W. Johns Manufacturing Co.—H. G. Issertel, W. F. D. Crane, J. W. Perry, W. H. Gould, New York.
Johns-Pratt Co.—E. D. Hatch, H. Liscomb, Hartford, Conn.
Johnson Co.—W. W. Kingston, E. B. Enterwish, H. C. Evans, Johnstown.
Jackson & Sharp Co.—G. S. Pratt, J. H. Jackson, Wilmington, Del.
Keller Painting Co.—J. F. Brushe, New York.
Laconia Car Co.—F. E. Huntress, Laconia, N. H.
Mondeman Fender.—W. M. Crandall, Brooklyn.
Morris, Tasker & Co.—C. F. Flanders, S. Bowman Wheeler, Philadelphia.
McGuire Manufacturing Co.—W. J. Cooke, Chicago.
Morton K. Moore.—H. C. Hornady, Atlanta.
New York Electric Works.—C. W. Van Fleet, New York.
R. D. Nuttall Co.—J. H. Bonchard, F. A. Estes, C. N. Wood, Allegheney, Va.
New Process Raw Hide Co.—A. C. Vosbaugh, Syracuse.
New Haven Car Register Co.—F. C. Boyd, J. S. Bradley.
Niles Tool Works.—W. A. Stadelman, Hamilton, O.
New York Leather Belting Co.—H. Fairbrother, New York.
Okonite Co.—W. L. Candee, New York.
Ohio Brass Co.—C. K. King, Mansfield, O.
Pettingell-Andrews Co.—F. X. Cicott, Boston.
Pomeroy & Fisher—J. Pomeroy, New York.
Partridge Carbon Co.—J. Partridge, Sandusky.
Pneumatic Fender Co.—W. Leonhardt, Baltimore.
Paige Iron Works.—E. S. Netherent, H. W. Paige, Chicago.
Peckham Truck Co.—Messrs. Peckham and Cooke.
Pintsch Gas System.—W. St. John.
Pratt & Letchworth.—W. H. Tayler, Buffalo.
Pennsylvania Steel Co.—J. P. Octron, Philadelphia; Chas. Clarke, Boston.
Philadelphia Car Wheel Co.—J. H. Yardley.
National Lock Washer Co.—R. L. Thomas, New York.
Quaker City Car Equipment Co.—J. E. Loughridge, Philadelphia.
Railway Register Co.—Ed. Beadle, New York.
Railroad Gazette.—E. A. Simmons, New York.
Rochester Car Wheel Co.—F. D. Russell, Rochester, N. Y.
Robinson Radial Car Truck Co.—W. Robinson, Boston.
Standard Underground Cable Co.—F. G. Degenhardt, Pittsburgh.
Sterling Supply Co., New York.—J. H. Carson.
Southern Electric Works.—Fred. Miles, Atlanta.
Standard Railway Supply Co.—G. Myers, Chicago.
Street Railway Journal.—J. H. McGraw, E. Caldwell, J. B. Bennett, C. B. Fairchild, New York.
Street Railway Review.—J. Boyd, H. Kenfield, H. H. Windsor, Chicago.
Sargent & Lundy.—B. J. Jones, Chicago.
Scarritt Car Seat Co.—H. O. Nowse, St. Louis.
Street Railway Gazette.—C. E. Stump, New York.
John Stephenson Co.—J. W. Pugh, New York.
Stanwood Manufacturing Co.—F. H. Stanwood, Chicago.
Smith, of New York.—T. C. Millen.
St. Louis Register Co.—J. W. Allison, St. Louis.
Valentine & Co.—Fred. Collins, New York.
Vacuum Oil Co.—E. A. Record, Boston.
Young Lock Nut Co., New York.—F. D. Stewart.
Thomas Smith & Co., New York.—C. T. Smith.
Terre Haute Car Manufacturing Co., Chicago.—D. B. Dean.
Taylor Electric Truck Co., Troy, N. Y.—John Taylor.
Washburn Car Wheel Co., Hartford, Conn.—J. T. Babbitt, Jr.
Wadham's Oil and Grease Co., Milwaukee.—A. J. Moon, E. A. Wadham.
Walker Manufacturing Co.—W. H. Bone, R. N. Bowles, J. C. Meaker, S. H. Short, J. M. Alpense, G. A. Kohler, F. H. Kohler, H. McL. Harding, Cleveland, O.
Westinghouse Electric Co.—E. H. Heinrichs, G. C. Means, R. S. Brown, W. C. Clark, J. G. McCarty, B. S. Samms, J. R. Gordon, Pittsburgh.
A. Whitney & Sons.—B. F. Stewart, F. A. Lere, Philadelphia.
Washburn & Moen Manufacturing Co.—H. C. Willis, New York.
Wallace Electric Co., Chicago.
H. J. Wightman & Co.—H. J. Wightman, Scranton, Pa.
Wells & French Co.—C. F. Corry, Jr., Chicago.
E. F. De Watts & Co.—E. F. De Wille, Lansdelengh, N. Y.
William Wharton, Jr., & Co.—P. Evans, Philadelphia.

If the Montrealers are half as glad to see the street railway men as were the people of Atlanta, the American Street Railway Association's next convention will be a big success.

Mr. James Partridge, of the Partridge Carbon Company, of Sandusky, made many friends for his carbons among the street railway men. He had carbon brushes that had been in use for a long time yet no wear was noticeable.

THE RETURN FROM ATLANTA.

INCIDENTS ON THE HOMEWARD JOURNEY OF THE STREET RAILWAY DELEGATES.

After the most successful convention in the history of the American Street Railway Association, and at the end of three days of continuous work and entertainment, the tired but happy delegates gathered at the Union Depot in Atlanta at 11 o'clock on Friday evening to take the cars for home.

The specials were divided into two sections, one leaving at 11 and the other at 11.30, the objective point being Chattanooga. This place was reached Saturday morning, and a most enjoyable day spent in visiting the historic points of interest, including Lookout Mountain and Missionary Ridge. At Chattanooga resolutions of thanks to the street railway people of Atlanta and Chattanooga were unanimously adopted.

The start from Chattanooga was made at 6 30 P. M., and from there to Knoxville, Tenn., the sections were combined, making a splendid train of nine Pullmans and a baggage car.

At Knoxville the party separated, the Southern Railway contingent going to Asheville, N. C., and the Norfolk & Western party to the Natural Bridge of Virginia and Luray Caverns. Several hours were spent at each of these places, and the visit greatly enjoyed by all hands. On arriving at Luray the delegates gathered on the platform and tendered a resolution of thanks to Mr. L. J. Ellis, eastern passenger agent of the Norfolk & Western road for his untiring efforts for their comfort and enjoyment, and the admirable manner in which the schedule was arranged and carried. It was voted unanimously to have these resolutions suitably engrossed and presented to Mr. Ellis with a handsome souvenir of the occasion. Mr. Ellis responded in a few modest and well chosen words.

So well pleased were the members under his charge that before separating a movement was inaugurated for making up a special to bring the southern delegates to New York for the next convention, to be joined there by the local delegates and to continue under his care to Montreal.

The special train under the care of Mr. Geo. C. Daniels, of the Southern Railway, enjoyed a delightful stop at Asheville, breakfasting and lunching at the Battery Park hotel. They also were taken up to the George Vanderbilt mansion, through the courtesy of the Southern Railway, and were privileged to visit the magnificent palace and grounds—the grounds acquired by Mr. Vanderbilt comprise over 100,000 acres—and enjoy the beautiful views. After leaving Asheville, the scenery again became bewilderingly beautiful, and the ladies and gentlemen went into raptures over it. Resolutions of appreciation appear elsewhere.

Four years ago the right to build and operate an electric railway in Ottawa, Canada, was going a-begging. There were few who were daring enough to believe that it was an enterprise that gave a reasonable expectation of profitable investment. The result, however, is that it has paid a handsome dividend from the start, but not greater than the enterprising gentlemen who made the venture are fairly entitled to. The road is controlled by the firm of expert electricians, Messrs. Ahearn & Soper, who built and equipped it.

East Greenwich, R. I., may soon have a trolley line.

CITY AND SUBURBAN ELECTRIC RAILWAYS.

ABSTRACT OF COMMITTEE'S REPORT TO THE AMERICAN STREET RAILWAY ASSOCIATION, ATLANTA, GA., OCTOBER 18, 1894, SUBMITTED BY E. C. FOSTER.

It is difficult to make the distinction between city roads and suburban roads. The function of nearly all city roads is largely to convey the people from the residential districts, mainly in the suburbs, to the business sections, and likewise, from the latter to the former. In the improvements it has made in this class of transportation lie the greatest benefits of the application of electricity to street car propulsion. Next to this most important use of the electric railways comes their use in furnishing recreation for the masses of the people. The two necessary conditions in the accomplishment of the scheme of country air for the masses are, first, the public parks, and second, the means of transportation to them. On a portion of the Blue Hills, only 10 miles distant from the heart of the city of Boston, over 1,200 acres have been secured to be preserved forever for the benefit of the people. Also, in Arlington, a like distance in another direction, a large reservation is made; Middlesex Falls in another, and the commission is now turning its attention to the shores of Revere Beach, immediately north of the city, one of the grandest beaches of this continent. It is needless to add that the street railway companies are doing their share in the matter of providing the necessary transportation. While their motives are not purely philanthropic, the results accomplished are of almost as substantial benefit as though the people only were considered.

As a road is projected, and studied from a financial point of view, first, then constructed, and then operated, it may be well to consider these topics in this same order. The first point, covering the work preliminary to the construction, admits of nothing but rather general discussion. A line to pay should be one that makes itself a necessity to the people, in offering them the best facilities for transportation in the particular direction. Competing lines should be avoided, excepting where the volume of business is large enough to support both. Beside the assurance that the line is necessary to the people accommodated, it must be ascertained that the number of the latter is large enough to support the road on a paying basis, not only the first year, when the repairs are slight, but later, when reconstruction becomes necessary. I consider that there are very few cases where a company is warranted in investing its money in a line, on the strength alone of the future that may be expected from it. A road should be, at least, capable of earning its operating expenses from the start, and the evidence of a more prosperous time later on should be very strong, before it is constructed without immediate promise of good dividends. It is sometimes necessary for an established company to build on a location, merely to keep out competition. The only thing that warrants this is the knowledge that the opportunity exists for the proposed competing company to be self-supporting from the start and ultimately a serious rival. Otherwise it is economy to allow them to build the road and buy them out at the foreclosure sale.

The kind of construction most desirable for a certain location depends, of course, entirely upon the particular conditions. For roads connecting towns I think that it is often possible to secure an independent right of way for a very slight cost per mile and very often for nothing; this might require special legislation. If, in this way, the right of way can be obtained that is desirable as to route and grade, it offers many advantages that cannot be had on public highways. For such a right of way the regular steam road form of construction would be employed. About a 60 pound T rail, 6x7 inches oak or chestnut ties, laid two feet centers, needle switches with lever throw, etc., would give a track that would allow a speed of 40 miles an hour, making it necessary to slacken speed only for curves, and as much for switches as the overhead construction demanded, the track switches requiring no reduction of speed. Curves in such a road should be few and of the longest possible radii.

Where it is decided to build on country roads, a location at the side of the road is, of course, preferable. Here T rail may be laid and the track filled with gravel covering the ties and leaving the heads of the rails entirely exposed.

In the streets of smaller towns, where permission can be obtained, it is also desirable to lay T rail, although there is always more or less trouble maintaining the paved brow that is usually required and consequent difficulty in plowing snow from the track, due to the shears and diggers of the plow striking the partially displaced blocks.

In city streets, and others that are paved, the girder rail seems to be the only one suitable. In order to obtain the necessary depth for paving, this rail should be nine inches deep, and should weigh about 90 pounds per yard. This makes very expensive construction, but the expense is justifiable when the conditions are considered. While such construction is necessary, where laid in streets paved from curb to curb, it is an open question in my mind as to what is best in macadam streets. There are many lines that are operated on 15 or 30 minutes, or even on hourly intervals, where the business is hardly such as to warrant the use of track construction costing from $20,000 to $30,000 per mile. The frequency of the service is an important factor in determining the most economical construction for use under particular conditions, and I think that the nine inch girder rail ceases to become a necessity, and becomes a luxury, when the number of cars run over it daily is reduced below a certain figure. Further, there are positive objections to the use of such rigid construction as this in dirty streets, as in macadam streets where the top dressing contains a great deal besides stone. My experience has been that the rail becomes covered with dirt, and that the cars rattle and "chatter" badly in running over it, more than in running over a dirty rail of less rigidity.

It may seem revolutionary to suggest it, but I think that, for certain places, it is at least worth while to consider relaying good tram rail, using some approved form of joint plate.

Regarding equipment, my idea is that the longest car that can be operated successfully on four wheels is the most desirable for the ordinary conditions. For long distance lines having heavy traffic, I would recommend 30 foot bodies, on double trucks, for box cars, and 15 bench open bodies, on similar trucks. Where there is a sufficient demand, I should run a combination smoking and baggage car as the trail car of a train of two.

In building a new road for short distance travel, I should give all curves the necessary radii for the use of seven foot wheel bases through them, and have trucks this standard. On these trucks I should use 20 foot box cars and 10 bench open cars, either class measuring about 29 feet six inches over the buffers. As a supplement to the regular equipment of motor cars, I recommend trailers, and that they may be run economically, a power brake is necessary. To meet this demand, the air brake is being developed, and promises to fill the requirements. For convenience in attaching trailers to motor cars, automatic couplers are necessary. There are several forms of latch couplings that can be made to do the work satisfactorily. An important thing in connection with the use of trailers is the adoption of, and adherence to, a standard, that all buffers and draw-bars may be of one height, and other parts right for the proper operation of cars in trains.

For electrical equipment, it goes without saying that the modern multipolar single reduction motors, with series parallel controllers, are the only ones that a road can afford to use. The performance of the various equipments now manufactured by the different companies has been so universally satisfactory that I feel that a great deal has been accomplished in the past two years in the development of the car equipment.

I am a firm believer in the desirability of heating all cars in the North, thinking that it has a very important effect upon receipts. As much as I like the results obtained from electric heating, I hardly feel that we can depend upon this method. Our experience is that it takes from eight to 12 amperes to keep a 20 foot car comfortable, that is, 40 degrees above the outside temperature. This means that it requires about as much current per hour as to propel a car four miles. This would make 72 car miles of power per day of 18 hours chargeable against the heaters. When it is considered that this extra power is often demanded when power is needed for other purposes, as in snow storms, it may be seen that, aside from the question of cost of coal, the consideration of the necessary increased capacity of the power station and feeder system is an important one. Having put myself on record as opposed to electrically heated cars, it is probably expected of me that I present a method that is satisfactory. Unfortunately, though, this I am unable to do. For short trips, run from a car house, the hot water storage system may do. We still depend upon the stove, and "with all its faults we love it still," until we can find something that we consider an improvement upon it.

It is not improbable that before long a telephone will be considered a necessary part of the equipment of each car operated on suburban lines. It often happens that means of communication with the nearest car house, or with the starter, would save much delay, and even danger, in cases of cars disabled or thrown off their schedule time by other causes. Either a telephone in each car, with means of plugging in on convenient poles or 'phones, arranged at the turn-outs, in boxes, may be used. As a substitute for this arrangement, or in connection with it, a system of signals between turn-outs may be desirable, under certain conditions. By the use of lantern boxes, containing incandescent lamps, and the necessary hand or automatic switches, a simple system of signals may be devised, by means of which cars running between turn-outs on single track lines will be protected from meeting other cars.

While these devices may be necessary in some cases, they will always be more or less burdens, in the complications they add. The signal system, especially, has one important objection. Regardless of the most carefully enforced rules to the contrary, men will learn to consider it as freeing them from the necessity of maintaining the same careful lookout for approaching cars, and in cases of failure of the signals, accidents will be more likely to occur than they would without the signal system.

The adoption of a proper schedule of fares and transfers is a most important matter. Where lines are short enough to allow the use of the one standard fare throughout, this question is a simple one; but where routes are longer, and it becomes necessary to collect higher fares, complication commences. When this latter condition is aggravated by systems of transfers, the complexity increases. My experience has been that, in general, it is best to divide such a line into sections, collecting a single fare in each, and registering all as the standard fares. These sections are arbitrary, of course, but in our case are determined by town boundary lines. For instance, where we have a line running through several towns, we collect a single five cent fare in each town. In connection with this, I would say that there are instances where further restrictions need to be made. Cases have arisen where towns of large area have comparatively small centers of population a long distance apart. Single fares have been established as being good anywhere within the limits of either town. A line is then built connecting the two towns, and instead of 10 cents, it is considered necessary to get 15 cent fares. The question then arises as to how the required three sections can be arranged. According to established precedent, the five cent fare sections include each whole town, although the line in question did not exist when this understanding was originated. In this case, however, it becomes necessary to establish the third section as including that part of the line between the boundaries of the more thickly populated portions of the towns and including the intervening open country in both towns. As an exception to this method of paying fares "on the instalment plan," I would mention the case where there exists a very heavy through traffic on a line, compared with which the local traffic is slight. In this case I consider it best to collect the whole fare at once, issuing to the through passengers conductors' private checks. These latter are held by the passenger, as evidence that he has paid through fare and surrendered to the conductor before the end of the trip.

The selection of the best rates of fares is a matter requiring the consideration of numerous conditions governing the particular case in question. It is safe to assume that the result to be worked for is the earning of the largest possible net revenue, considering, at the same time, the development of the business. I consider one and one-quarter cents per mile a minimum rate for the basis of a system of fares, no fare to be less than five cents, and would advise the establishing of higher rates, up to two cents, as the particular conditions would seem to recommend.

In certain cases I think it advisable to sell round trip tickets. Our fare from Lynn to Boston is 15 cents, but we sell two tickets for 25 cents. We think that the possession of this return ticket leads people to use our cars when they would otherwise patronize the steam roads. We have no other commutation, except workingmen's tickets over certain routes, good only during the hours of six and seven, morning and evening. Transfers may be used within reasonable distances. The system must, of course, be carefully worked out, to

avoid the possibility of abuse. Suburban roads work at a disadvantage compared with city roads, when the question of operating expense is considered. There are many reasons why a given number of cars can be operated for less money within a small territory than when spread over a large area. These reasons are obvious. Another important disadvantage under which the suburban road labors is that of the high cost of power. It usually is dependent upon a number of small stations, due to the fact that it is impossible to cover the necessary territory from one station, and both the labor and coal consumption of small stations are necessarily greater per car mile than are those of large ones. The opportunities of making the expense in the first instance, that of car house work, compare favorably in the small house with the large are rather few. They lie in the dependence upon one capable man, circulating among the houses, directing the efforts of lower priced labor. Another idea that suggests itself is the equipping of one house with a complete outfit of labor saving appliances and bringing all unusual repairs to this house. This is objectionable, however, in that it requires the moving of cars over long distances, at a time when they are least in condition; and, further, that it makes two gangs of men responsible for the care of the cars. Regarding the elimination of the difference in power costs, now existing in favor of the city road, the indications are that the time is coming when it will be no longer necessary for the country road to maintain its numerous steam plants. I refer to the probable introduction of the alternating system of long distance electrical transmission into railway work. Suppose the case where it becomes necessary to distribute power for railway purposes over large areas, as on many suburban roads where several power stations are now used. With this system, there need be but one main power station, which can be located at the point possessing the greatest advantages for cheap production of power. At various selected places rotary transformers may be placed, one for each section of road. These receive alternating current, over long distance lines, from the main station and deliver it as direct current to the trolley wires, or possibly to such local feeders as may be necessary for the distribution throughout the particular section. These rotary transformers require only the same care as generators. Beside them, the only apparatus in the sub-station needing attention would be the circuit breakers. The latter would be arranged between the rotary transformers and the lines, in the same way that those in the present stations are. It will be seen, therefore, that one ordinary dynamo tender would be all the labor required in a sub-station. Further than this, the sub-station might often be in car houses, where one of the regular employés could care for the machinery, thus reducing the labor charge to a minimum. By this arrangement power could be distributed to cars operating over areas of from 25 to 50 miles radius from one station at cost slightly above that for distribution within the ordinary distances of present practice. I am told that with such a system, using 6,000 volts, three phase currents, from a station located at the central point, we could supply power by the use of three No. O Brown & Sharpe wires to a road 50 miles in length, when 50 cars were being operated. The total efficiency of this transmission, neglecting the loss in the trolley wires, would be about 65 per cent. These 50 cars, on the 50 mile road, would give 15 minute headway, with a speed of eight miles per hour. With the higher speed, that would more probably fit the conditions of such a road, the number of cars would be reduced, allowing a proportionate decrease in the size of the wires, so long as the current allowance, 20 amperes per car, was sufficient. To accomplish these same results with the present system of 500 volts would require 600 No. O Brown & Sharpe wires, the use of which would, of course, be impracticable.

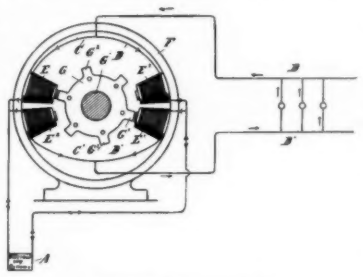
While this system has many advantages which are sure to result in its extensive application, it has its attendant disadvantages, which must be overcome. Most important of these is the difficulty of insulating the lines. Practice has been to use bare wire, simply because the covering is of no use with such voltages. The principal use of the insulation on the majority of overhead wires is a sentimental one. The public prefers the appearance of the covering to the bare wire. It is probable that it will be wise to recognize the existence of this preference and cover the wires, merely to save comment. The most serious difficulty, however, lies in the fact that it seems to be absolutely necessary to keep the wires out of the trees. Mr. Geo. D. Johnson, superintendent of the Hartford Electric Light Company, writes that a twig short circuits their 5,700 volt mains almost as readily as a wire.

It will be evident that the adoption of a long distance transmission system will admit of the use of any suitable water-power that may be located too far away to be available under the direct method of transmission.

The Penberthy Injector.

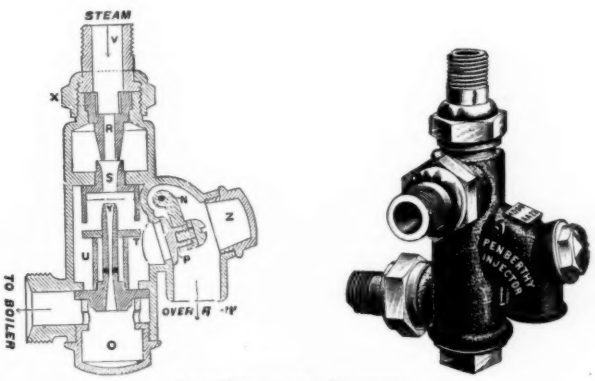
The Penberthy injector, which is illustrated herewith, is not new to steam users, having been on the market for about eight years, during which time 80,000 of these injectors have been placed on boilers in the United States and Canada. When this injector was first brought before the steam using public, the only boiler feeders in common use were the steam pump and what is known as the inspirator or positive injector. The Penberthy was the first practical working automatic injector, the difference between the two being that in the positive machine or inspirator, if the current of water to the boiler is broken by any sudden jar, the machine must be entirely closed off and restarted, requiring the constant attention of the engineer lest it should stop supplying the boiler, while the automatic injector under the same circumstances will at once take up the water and restart without the manipulation of any valves whatever.

Since the Penberthy was first manufactured it has been continually improved, the makers seeking by every possible means to better its working qualities, and, while numerous other so-called automatic injectors have been placed on the market since that time, the Penberthy remains to-day the standard among this class of articles. It is especially notable for the simplicity of its construction, the working parts being accessible for cleaning without disconnecting the injector from the piping. It works on lower and higher steam pressures and on greater lift than any other automatic injector manufactured, and is the only injector of any kind anywhere made that will lift water through 18 feet of hot suction pipe.



McElroy's Converter.

It is manufactured by the Penberthy Injector Company, of Detroit, Mich., whose exhibit of this and other steam specialties at the World's Columbian Exposition was one of the finest among the smaller exhibits in Machinery Hall. They received from the judges at the fair not only the usual diploma awarded all exhibitors, but special mention for excellence of the injector as well as a gold medal. They will send a catalogue of their steam specialties to any engineer or steam user upon application.



The Penberthy Injector.

A newspaper man writing from Stockholm says that amongst all countries on the globe Sweden takes precedence in the development of the telephone, where there is one telephone to every 18 inhabitants. All business is transacted by telephone. Telephone communication can be had for $10 per year, when the charges in 1880 were as high as $75. No extra charge is made for telephoning within a radius of 50 miles. A three minutes' conversation between the cities of Malmo and Solleftea, a distance about twice that between Chicago and Minneapolis, costs only 27 cents, and six cents for every exceeding minute.

Converting Alternating Currents into Direct Currents.

One of the drawbacks to the alternating current for a general system of distribution is its unsuitability for electrolytic and other kinds of work in which direct current is absolutely necessary. With a view to providing a simple device for converting alternating currents to direct currents, Mr. James F. McElroy, of Albany, N. Y., has devised the apparatus illustrated in the accompanying engraving, which he calls "an electrical current director." It comprises two pairs of magnets and a laminated armature arranged to close a magnetic bridge alternately between the two pairs of magnets. The two pairs of magnets are connected in multiple arc relation to the alternating circuit, and the circuit in which the direct current is desired is tapped at points between the two pairs of magnets. For example, in the engraving A illustrates the source of alternating current, the two leads passing in multiple arc through the pairs of magnets E, E^1 and E^2, E^3. The armature G has its projecting teeth twice the distance between the adjacent magnets, so that when a magnetic bridge is formed between magnets E, E^1, no such bridge will be formed between E^2 and E^3. The magnets are so wound that the counter electro-motive force, when the magnetic bridge is closed, is sufficient to cut off current through the pair of magnets so bridged, whereas less opposition will be offered by way of the other pair of magnets. The armature G is mounted on a shaft driven by a synchronous motor. In the position shown in the engraving it is evident that current will flow in the direction indicated by the arrows in the circuit B, B^1. When the armature moves so that magnets E, E^2 are bridged, current having been reversed by reason of the synchronous movement of armature G, the main current will enter magnet E^1, since its bridge is then opened. It is, of course, necessary in this system to so wind the magnets that the counter electro-motive force when the magnets are bridged will closely approximate the applied electro-motive force.

An Electrical Phœnix.

The Siemens & Halske Electric Company's factory was destroyed by the great lumber fire in Chicago, August 1, 1894. The company made a lease with the Grant Locomotive Works, August 11; they commenced moving into the new works August 15; they finished and shipped the first generator, built entirely at the new factory, October 15. Every available tool in the new works is now in operation and many of the tools which were destroyed in the fire have been duplicated so that from now on the company is in a position to finish one direct coupled generator each day. These few simple facts indicate the dauntless spirit of the company and they are certainly to-day in a better condition for competition in the electrical field than before the fire.

EXHIBITS AT ATLANTA.

THE FINEST ELECTRICAL AND STREET RAILWAY DISPLAY EVER PRESENTED BEFORE THE ASSOCIATION.

GENERAL CONVENTION NOTES.

Few of the delegates when they arrived at Atlanta for the first session Wednesday morning had any idea of the appearance presented by the exhibition hall on the preceding afternoon.

Chaos reigned, but out of it all order was rapidly developed and another sunset showed a very different scene. The vast floor space was littered by a miscellaneous mass of stuff—rails, trucks, heavy and light machinery, tools, motors, generators, and in fact everything connected with the street railway industry.

The buzz of the saw and ring of the hammer was heard in every corner of the building, hundreds of feet were hurrying to and fro, and over all rose the melodious chant of the dusky laborers pulling and hauling on the tackles by which the heavy machinery was unloaded from the cars and put in place. A queer lot are those same Georgia darkies as viewed by Northern eyes, and picturesque withal in their ragged clothes and jovial ways, good natured at all times and good workers, too, under the direction of a man who knows how to handle them. Their methods are peculiarly their own and the songs, choruses and chants to which they bend their backs to a pull are certainly original. Some of them are rather hard to understand, but one of their favorites and one that is chorused with great glee is "*Ice — cream — cream — cream*" with a pull together at each word. The effect of this chorus echoing through the building and dominating the many other sounds with its mellow ring was not unpleasing to the ear, and served as a reminder that we were in the sunny South.

Wednesday morning, October 17, dawned bright and beautiful, a typical southern Autumn day, and the hundreds of visitors who arrived the night before were early astir, crowding the hotel corridors and giving an appearance of unusual animation to the streets.

Elegant cars of the newest designs and bearing the names of the best builders in the country were running on all of the lines in the city, and it is safe to say that never before was such a collection seen in the streets of Atlanta, or any other city of the South. The builders took this practical method of exhibiting their cars and it is one that was fully appreciated by the Consolidated company and by the public.

At the exposition hall the past 24 hours had worked a wondrous change, and on Wednesday morning it presented a very attractive appearance. Nearly all of the numerous exhibits were in order and the balance were rapidly nearing a state of completion. The hall was gay with bunting; handsome signs and decorations met the eye at every turn and, combined with the attractive line of exhibits, made a pleasing picture.

One of the first to be finished was the headquarters of the ELECTRICAL REVIEW, where comfortable chairs, convenient desks and copies of the special street railway issue greeted the many visitors. Among the first to call and register their names in the REVIEW'S record were Governor Northen and President Payne.

In the center of the hall and facing the main entrance stands the big Corliss engine, at present in a state of idleness, and draped in red, white and blue. For this occasion, steam had given place to electricity and the dynamos, motors, trucks and other machinery were operated from the street railway circuit, current being taken from a feeder running below the line of shafting.

THE EXHIBITS.

On the right of the main entrance the first exhibit encountered was that of Linburg, Sickel & Company, of Trenton, N. J., manufacturers of the Trenton trolley wagon. A very handsome specimen of their wagon with extension platform and tower was in operation and the Georgia darkies who were utilized as impromptu linemen, cut some queer capers at the top of the tower, greatly to their delight and the amusement of the crowd.

Next to this was the exhibit of the Meaker Manufacturing Company, of Chicago, Ill., showing samples of their new hanger and mechanical clip. The exhibit was under the personal charge of Mr. J. W. Meaker.

The Stilwell-Bierce and Smith-Vaile company were represented by J. W. Taylor, southern agent, and a line of their pumps, feed water heaters, friction clutches, railway jacks, etc., was tastefully displayed. Mr. Taylor reports business through the South in his line as particularly good and that a majority of the finest plants in this section have their equipment.

The National Lock Washer Company, of Newark, N. J., were next in order and had a fine display of their goods. They claim that over 90,000,000 of their washers are in use on the principal railways of the country for track, motors, trucks and cars.

The Fulton Truck and Foundry Company occupied a large space in the center of the hall and had on exhibition one of their hydraulic motor lifts, as well as one of their single and one double "Imperial Truck." These have solid steel frames, are equipped with double tread wheels and independent brake rims, as well as an improved life guard. An improved track cleaner was also displayed, which is so arranged as to pass over any obstruction too heavy to be removed without damage to the apparatus. The exhibit was under the personal supervision of Mr. W. E. Haycox, president and general manager.

The Card Electric Company, of Mansfield, O., had on exhibition one of their 35 horse-power single motor equipments with field core thrown open for inspection, and had also one of the same motors attached to the "Double Imperial Truck" of the Fulton Truck & Foundry Company, which it was operating by a connection with the 500 volt circuit in the building. This equipment is particularly adapted for heavy cars for interurban traffic. One of their new series multiple controllers was also shown, embodying novel features in construction and operation. An entirely new pneumatic switch for heavy currents was shown for the first time. This switch is something so entirely out of the ordinary run that it merits a more detailed description than can be given at this time. It will be fully illustrated and described in our columns in the near future. Mr. George F. Card was in charge of the exhibit and was kept busy showing his machines to a curious crowd.

Mr. William Leonhardt, inventor of the Leonhardt Pneumatic Fender Company, of Baltimore, Md., had one of his fenders attached to the front of a car and was kept constantly on the jump in showing its operation to inquisitive visitors. Mr. Leonhardt gave a practical demonstration of its value as a life saving device by lying down in front of it and allowing it to pick him up.

The Berlin Iron Bridge Company had probably the most striking exhibit in the building, consisting of a steel electric railway power station erected by their workmen on the spot. The reputation of the Berlin Iron Bridge Company for this class of work is too well known to need further mention, and the station on exhibition was a perfect illustration, on a small scale, of the manner in which these buildings are constructed. The model shown was 20x20 feet with a height of 23 feet and was built of steel throughout. The roof was of galvanized corrugated iron, lined with the Berlin patent anti-condensation roof lining. The roof was supported by trusses on steel posts and had a pitch of six inches to the foot. The exhibition was in charge of Jno. M. Field, assistant engineer, who was entertaining his many callers in his usual genial manner.

The Davis Car Shade Company, of Portland, Me., were represented by C. M. Fuller and L. P. Hills. Their exhibition consisted of a side section of a closed street car and a section of an open car fitted with their improved shades. Four different designs of very handsome styles were shown, the special feature of which was the rubber rollers at the ends of the fixture or holding device, constituting anti friction tips.

The H. W. Johns Manufacturing Company had a very handsome display of moulded mica and trolley line insulating material, including switches and frogs, the Grouten rail bond and several other new devices. The sectional samples very thoroughly illustrated the construction of the various insulators. The exhibit as a whole was one of the most attractive in the building and fully repaid the amount of time and labor expended on it. Aside from the articles already mentioned, numerous samples of vulcabeston controller pieces, brush holder bushings, etc., were displayed, as well as asbestos pipe coverings, clothing and other fireproof goods. The company had a number of representatives present and distributed a large amount of printed matter and some unique souvenir buttons made of moulded mica. Mr. W. F. D. Crane, of the company's electrical department in New York, and Mr. W. H. Gould, one of the southern representatives, were in charge of the exhibit. Mr. Hatch and Mr. Issertel of the company were also present.

The largest exhibit of the convention was made by the Paige Iron Works, of Chicago, Ill., who occupied 1,200 square feet of floor space in the center of the building. Their exhibition consisted of a line of double tracks showing switches and crossings in both girder and T rails. The T rail work was laid on steel ties, and a portion of it was filled in with crushed stones and brick paving, showing the practicability of the T rails for paved streets. The work was an exact fac-simile of that done for the Terre Haute Electric Street Railway Company, of Terre Haute, Ind. Mr. Alonzo W. Paige, president of the company, and Mr. E. S. Nethercut, engineer, were in charge of the exhibit.

The exhibit of the R. A. Crawford Manufacturing Company, of Pittsburgh, Pa., consisted of a full line of their automatic fender equipments, showing them in the different positions of service. Their wheel guard for electric cars was also exhibited.

The Pennsylvania Steel Company, of Steelton, Pa., made an attractive display of their specialties in T and girder rail work, consisting of both cast steel and built frogs, switches and mates. A decided novelty in the line of rail display was a right angle nine inch girder crossing, in a vertical position and flanked on both sides by a reverse curve 6½° radius nine inch groove rail. The balance of the exhibit covered everything in the way of switches, frogs and crossings used in street railway construction. Mr. Chas. W. Reinoehl, of Steelton, Pa., was in charge.

The Michigan Electric Company, of Detroit, Mich., exhibited a complete line of their overhead material, including trolley hangers, switches, cross-overs, insulators and other devices. The goods of this company have been in use on various roads throughout the country for the past two years, but have not heretofore been actively pushed, it being their desire to have a thorough practical test of their efficiency and durability before placing them strongly before the trade. These points having been thoroughly demonstrated, they were now exhibited for the first time. A particular feature which attracted considerable attention was the clamp used with trolley hangers, which is claimed to be the simplest and strongest ever devised. Another feature is a new devise in the shape of a signal light for use in designating the route of cars at night. The light is placed on the outside of the car, attached to the revolving base of the trolley stand, so that it always faces with the car. An incandescent lamp is placed in a lantern behind a semaphore lens, which throws all the light forward in parallel rays, and enables the light to be seen and the color distinguished at a long distance. Mr. Jos. E. Lockwood, president of the company, was in charge of the exhibit.

"Smith, of New York," was the sign displayed over a very fine exhibit of street railway lamps, both oil and electric, and among the designs was embodied everything of the latest and best in this line. One handsome design was a cluster electric center light with a 22 inch silvered glass reflector, with nickel base. There was also a handsome line of combination center lamps in bronze, which can be used with candle or oil, and a fine display of the standard headlights. Mr. T. C. Millen was on deck as usual, and lost no opportunity of keeping "Smith, of New York," prominently before the convention.

The Niles Tool Works, of Hamilton, O., included in their exhibit a hydraulic press of 110 tons capacity, especially adapted to street railway work. This tool will take a wheel up to 40 inches diameter between tie bars. Another special tool is a car wheel boring machine for boring light car wheels up to 36 inches in diameter. The machine is equipped with a power crane for putting work on the table, which is fitted with a self-centering clutch, quickly manipulated by a single lever. The work revolves with the table while the cutting tools remain stationary. There was also exhibited a standard 24 inch swing lathe, to take eight feet between centers. This size lathe is being very generally used by street railways, it being large enough to turn armatures, axles and all general work. It has both screw and rod feed, extra long carriage, deep bed and is the heaviest 24 inch lathe built. Mr. W. A. Stadelman was in charge.

The exhibit of the Genett Air Brake Company was in charge of Mr. E. J. Wessels, general manager, and Mr. Geo. S Lee, master mechanic. It consisted of the original brake first used on surface roads and the open style pump which succeeded this, and which has been succeeded by the apparatus now in use on many of the leading roads throughout the country. Two heavy cars belonging to the Atlanta Consolidated Company are equipped with this brake and are in active use at this time. Their practical working on cars bearing visitors to the exhibition hall was the method adopted to display them to the best advantage.

The exhibit of the Chapman Valve Company, of Indian Orchard, Mass., consisted of the various sizes of high pressure steel valves, such as are in general use in street railway power houses and which are too well known to need description. The power stations in Atlanta are all equipped with these valves. Mr. E. L. Ross, mechanical engineer, and E. W. Buss, western manager, were in charge.

The Consolidated Car Heating Company, of Albany, N. Y., made a handsome display of their various devices for electrically heating cars, and had sections of car seats showing the different styles of fittings. They also exhibited their resisting conductors, snap switches and heat regulating switches and cut-outs. They were represented by Jas. F. McElroy, consulting engineer; Edwin A. Smith, general agent, and H. R. Ransom, special agent.

The representatives of the General Electric Company were W. J. Clark, general manager railway department, New York; A. K. Baylor, engineer's assistant, New York; J. R. Lovejoy, manager supply department, Schenectady; W. B. Potter, Schenectady; H. C. Wirt, Schenectady; T. P. Bailey, Chicago; H. J. Crowley, Philadelphia; F. M. Kimball, Boston; H. H. Corson, Nashville; A. F. Giles, Atlanta; D. R. Ballin, Atlanta; Geo. Rosenthal, St. Louis; G. E. Hoffman, Schenectady. Their exhibit occupied 600 square feet and was very handsomely displayed. An immense amount of material was shown, among which were their new G. E. 800 motors, the "K" series parallel controllers, generator and feeder panels, underground feeder tubing, line material of every description, car equipments of all kinds, and, in fact, everything used in street railway work. The exhibit was splendidly lighted by a number of "Thomson 93" arc lamps connected in series and operating from the street railway circuit. The General Electric Company also had extensive headquarters at the Kimball House, where their many visitors were entertained by the ubiquitous and pleasant W. J. Clark.

The Peckham Motor Truck and Wheel Company, of New York, made an extensive exhibit, showing one of their "Standard" cantilever extension trucks, one of their "Extra Long" cantilever extension trucks, besides a number of specialties and several handsome models. The "Standard" and "Extra Long" trucks were equipped with motors, one carrying a Westinghouse and the other a "G. E. 800." A very beautifully illustrated catalogue was distributed in large numbers. Edward Peckham, president; W. H. Wilkinson, superintendent, and W. E. Cook, Chicago, agent, were in attendance.

The Street Railway Advertising Company, of New York and Philadelphia, made a beautiful display of their system of street car advertising in conjunction with the Brooklyn Car Wood and Veneer Works, whose exhibition of street car panels and interior wood decorations was an attractive feature. Street car advertising has become something of a science, and, with the artistic surroundings furnished by these concerns, is very effective. A souvenir card, veneered in cherry on one side and quartered oak on the other, was distributed. Both companies were represented by W. B. Le Van, Jr.

The St. Louis Register Company, of St. Louis, Mo., had on exhibition a full line of their well known "Security" register. A novelty was a combination register, for use on cars having two separate compartments, such as those running on the Pacific Coast, and also the same combination for double deck cars. This allows of either register showing the total number of passengers carried. A transfer register was also shown. In these registers a point is made of showing the entire mechanism of the interior. J. W. Allison, vice-president, and Gustave Rein, superintendent, were in attendance.

The New Haven Car Register Company made one of the most attractive exhibits of the convention. Their large line of standard machines was fully shown, and in addition they displayed something entirely new in the line of a register adapted for recording three different denominations of fares, or two fares and a transfer, separately, and also totalizing each separately. This new departure attracted much attention among the prominent railway men present and received many favorable comments. The work for which this machine is specially designed has long been the cause of much trouble and annoyance to the street railway companies, from the fact that up to the present time they have had no register which would satisfactorily accomplish it. A similar machine for registering two fares, or one fare and a transfer, is now in course of construction. The ringing of these registers is accomplished by a specially arranged rod device in conjunction with a cord, and is very simple and complete. The regular style of register has recently been adopted by the Consolidated Company, of Atlanta, and is now in use on their cars. Exceedingly handsome and expensive souvenirs, in the shape of glass and nickel ink stands and mirror paper weights were distributed among the delegates, and were highly appreciated. Mr. F. C. Boyd, vice-presi-

dent and general manager, and Mr. J. S. Bradley, secretary and treasurer, were in attendance, and exerted themselves in every way to make things pleasant for their numerous visitors.

The exhibit of the Walker Manufacturing Company, of Cleveland, O., was one of unusual interest, and was at all times the center of an interested crowd. The principal attraction was a solid forged motor truck made by the Dorner & Dutton Manufacturing Company, of Cleveland, and equipped with two of the Walker company's flexibly mounted steel motors. The truck was elevated on supports allowing free operation of the motors, for the purpose of showing the advantages of this method of cushioning when running over rough tracks and uneven rail joints. Repeated illustrations were given of the easy and noiseless running of the motors and the effect of the spring suspension in easing the strain on the gears, under the severest conditions of reversing the motor under rapid headway. In connection with this truck two of their improved series parallel non-arcing controllers were exhibited. Another feature was a separate motor equipment running with the case open, and showing the method of removing the armature from the bottom. A 200 kilowatt railway generator was shown in active operation. S. H. Short, electrical engineer; W. H. Bone, manager; H. McL. Harding, general eastern agent; B. M. Barr and J. M. Atkinson, of Cleveland; F. W. and S. W. E. Kohler, of Chicago; and R. N. Baylis, of New York; under whose direction the exhibit was installed, were in attendance.

The exhibit of the J. G. Brill company, of Philadelphia, consisted of one No. 21 B truck for single truck cars and one No. 22 maximum traction truck for use under double truck cars. A section of a car showing new design of movable vestibule, so arranged as to be easily and quickly put on to open platform cars, was displayed. In connection with this a new design of brake mechanism was shown, which obviates the necessity of changing the brake shaft when the vestibule is put on. This is an important feature. This section of car is equipped with patent track scraper, sand boxes and radial draw bars. Mechanical jacks for lifting cars and samples of spring fenders form part of the exhibit. The Brill company also had three handsome cars of different designs running on the lines of the Consolidated company in Atlanta. Another feature which may rightly be termed a part of the exhibit was a car load of trucks sold to the Consolidated company and which were standing on the tracks outside the exposition building. The representatives of the Brill company were Jno. A. Brill, vice-president; F. C. Randall, Saml. M. Curwen, Wm. H. Heulings, Geo. N. Haskell and M. E. Curwen.

The *Street Railway Journal*, the *Street Railway Review* and the ELECTRICAL REVIEW all had comfortably fitted up headquarters in the exposition hall and received many callers, and thousands of copies of their current issues were distributed. The ELECTRICAL REVIEW was particularly favored in this respect, and its register contains the names of the leading railway and supply men from every section of the country. Many names of esteemed residents of Atlanta also adorn its pages, among them being W. J. Northen, governor of Georgia; Editor Clark Howell, of the *Atlanta Constitution*, and others. Of the exhibiting press, the *Street Railway Journal* was represented by J. H. McGraw, president; C. B. Fairchild, editor; H. W. Pool, W. H. Taylor, E. E. Higgins, J. B. Bennett, R. F. Outcault and Edward Caldwell. The *Street Railway Review* was represented by H. J. Kenfield, H. H. Windsor and Jas. Boyd. The interests of the ELECTRICAL REVIEW were looked after by Chas. W. Price, president and editor, and H. G. Tuckerman, New England manager.

The exhibit of the Johnson company, of Johnstown, Pa., consisted of a complete branch off, constructed out of 17 pound guard rail nine inches high, with a spring tongue switch. The mate and curve cross was shown in the new style of special work, which is known as the "guarantee construction." The frogs, switches and crossing points are hardened and toughened by the Harvey process, similar to that used in preparing the armor plates of United States men-of war. This insures the much longer life of these parts, which are, of course, subjected to the greatest amount of wear, but when it is necessary to replace them, it can be readily done without disturbing the body of the rail or the surrounding pavement, which is a point the managers of street railways will fully appreciate. Another feature of the exhibit was the Dupont truck. The construction of this truck is a radical departure from the style commonly in use, and has commended itself to those interested from its extreme simplicity and durability. The wheel base is unusually long, and can be extended to any desired length, as the weight of the car is supported by a continuous girder with elliptic springs at the extreme ends, thus greatly reducing the oscillation. Another important factor is the case with which the truck can be exposed for repairs and the wheels removed without dismounting any part of the frame. A model stand was displayed containing over 60 different types of girder rail from three to 10½ inches high, and from 40 to 112 pounds per yard. Another feature of track construction was shown in a curved cross of four and one half inch guard rail supported throughout by standard girder joints, making the height nine inches from ties A full line of various styles of joints and rail appendages was also exhibited. Mr. Daniel Coolidge, vice-president; Maj. H. C. Evans, of New York; W. E. Boughton, of Philadelphia; O. C. Evans, of Cincinnati; E. O. Evans, of Boston; A. S. Littlefield, of Chicago; E. B. Entwisle, chief engineer, of Johnstown, Pa.; W. W. Kingston and E. P. Thomas, of Atlanta, were present to entertain their many callers and talk Johnson material.

Among the other exhibits, all of which were interesting and merit description, were those of The Scarritt Car Seat Company, of St. Louis, Mo.; The Bushnell Manufacturing Company, of Easton, Pa.; The Burrows Car Shade Company, of Portland, Me.; The New York Electrical Works; Chas. L. Cornell, of Hamilton, O.; The Young Lock Nut Company, of New York; The Western Telephone Construction Company, of Chicago; The New England Engineering Company, of Waterbury, Conn.; The H. Falk Manufacturing Company, of Milwaukee, Wis.; The Fitzgerald Van Dorn company, of Lincoln, Neb.; The Bass Foundry and Machine Works, of Fort Wayne, Ind.; The Hale and Kilburn Manufacturing Company, of Philadelphia, Pa.; A. Whitney & Sons, of Philadelphia, Pa.; The Sterling Supply and Manufacturing Company, of New York; The Ohio Brass Company, of Mansfield, O.; The Stirling Water Tube Boiler Company, of Chicago, Ill.; Georgia Equipment Company, of Atlanta, Ga.; The Rochester Car Wheel Works, of Rochester, N. Y.; The Central Electric Heating Company, of New York; The Lewis & Fowler Manufacturing Company, of Brooklyn, N. Y.; The Roberts Woven Wire Car Seat Company, of Hartford, Conn.; The Wadhams Oil and Grease Company, of Milwaukee, Wis.; The General Agency Company, of New York; The Chas. Munson Belting Company, of Chicago, Ill; The Cutter Electrical and Manufacturing Company, of Philadelphia, Pa.; The Benedict & Burnham Manufacturing Company, of New York; The Creaghead Engineering Company, of Cincinnati, O.; The R. D. Nuttall company, of Allegheny, Pa.; The Adams & Westlake Company, of Chicago, Ill.; and the Dual Car Fender Company, of Albany, N. Y.

The Benedict & Burnham Manufacturing Company, of New York, made a very attractive display of their feeder trolley and magnet wires, as well as making a specialty of their solid one-piece copper rail bonds. These rail bonds are made in various shapes and sizes from pure Lake Superior copper, and were in great demand as souvenirs of the convention. Sections of track showing different styles of joints connected by these bonds were shown, and fully demonstrated the claims of advantages embodied in them over other bonds. They are riveted through the rail, can never become loose and insure a perfect contact at all times. Mr. Edwin H. Oswald and Mr. J. H. Woodward were in charge of the exhibit, and made things very pleasant for their many visitors.

The Eddy Motor Company, of Windsor, Conn., were ably and vigilantly represented by Mr. M. E. Baird. Their exhibit was shown in the power house of the Atlanta Traction Company, where two of their 250 horse-power multipolar generators of the latest type are in use.

The exhibit of the Jewell Belting Company, of Hartford, Conn., consisted of sections of their 69 inch 3 ply railway dynamo belt, their 48 inch double dynamo belt, transmitting 700 horse-power in the station of the Georgia Electric Light Company, their 24 inch 2 ply and 12 inch double dynamo belts, as well as samples of belt cement and belt dressing. Handsome souvenirs, consisting of leather bill folds, were distributed and were in great demand. Mr. Chas. L. Tolles represented the Jewell company and was fully equal to the task. Mr. Tolles had with him a few lizard skin pocketbooks, which were the most attractive souvenirs shown. All who got one were happy, and the supply was soon exhausted.

The New England Engineering Company, of Waterbury, ably represented by Treasurer A. O. Shepardson, exhibited the Breed emergency wagon. The street railway men took much interest in this practical piece of apparatus.

GENERAL CONVENTION NOTES.

Many additional matters of interest relating to this great convention will appear in the next issue of the ELECTRICAL REVIEW.

Capt. W. L. Candee, manager of the widely known Okonite Company, was accompanied by his wife to the convention, and they received much kindly attention from the hospitable people of Atlanta. The street railway fraternity were very glad to meet the popular manager of the Okonite Company, with which company so many of them are large patrons.

H. C. Willis, of New York, efficiently represented the Washburn & Moen Manufacturing Company.

On the return trip over the Southern Railway, Charles Odell, of the Massachusetts Association, was presented with a unique loving-cup, the versatile and eloquent R. S. Brown, of Boston, making the presentation speech. Mr. Odell appreciated the honor, and the cup filled with a fine punch was soon passed around.

Mr. W. J. Cooke, of Chicago, vice-president of the McGuire Manufacturing Company, was an active participant in the work of the convention and has hosts of friends among the street railway men.

Mr. J. H. Rhotehamel, president of the Columbia Lamp Company, of St. Louis, was in attendance, and had the pleasure of hearing many compliments for his excellent lamp from the street railway users.

Fred. Degenhardt came in from Chicago and stayed as long as he could—as long as Atlanta permitted.

Wm. Hazleton, 3d, of New York, actively represented the Societé Anonyme Industrielle des Etalissements Arbel, of France.

Frederick R. Case, of Philadelphia, ably and genially represented the great bolt and nut house of Hoopes & Townsend of his city.

Mr. William St. John, of New York, general agent, was present on behalf of the Pintsch gas lighting department of the Safety Car Heating and Lighting Company, of New York, and interested a great many of the practical street railway men in his system of car lighting. This system has been adopted by the Columbus, Ohio, electric road, and it is likely that many others will follow. The great Broadway cable car system, New York, is brilliantly lighted in this manner.

Howard Fairbrother, with the New York Leather Belting Company, had headquarters at the Kimball House.

President Payne came down from Milwaukee with a party of friends in his private car, and returned as far as Chattanooga with the delegates.

Mr. Chas. A. Schieren, Jr., made many friends for the famous "electric" leather belt made by his well-known house, Chas. A. Schieren & Co., of New York.

Mr. F. G. Fuller's rotund and genial personality ably looked after the interests of Day's Kerite. Mr. Fuller, who is the special agent of this company, made many friends on all sides for his high grade insulated wires and cables.

Mr. Frederic A. Lex looked after the interests of A. R. Whitney & Sons, car wheel manufacturers, of Philadelphia.

As active and popular as any one at the convention was Mr. H. H. Foster, of the Dreher Manufacturing Company, of New York. Mr. Foster probably got better acquainted with everybody than any other two attendants, and successfully carried away with him from the Southland a large number of mementoes, consisting of "cotton, cane and corn," and other things. His company is one of the largest manufacturers of oils.

The exhibit of the Westinghouse Company consisted of the street railway system at Atlanta. All the cars of the Atlanta Consolidated are equipped with Westinghouse motors and the large generators at the station are all Westinghouse. The company was ably represented by the following large staff: W. F. Zimmerman, assistant general manager, W. C. Clark, general agent, R. S. Brown, C. A. Bragg, E. H. Heinrichs, D. A. Tompkins, J. R. Gordon, B. F. Stewart, G. Pantaleoni, J. A. Rutherford

The news of the death of Hon. Samuel Winslow, of Massachusetts, very prominent in street railway circles, was received at Philadelphia on the return trip. The New England delegates passed appropriate resolutions.

The New England delegation on the Pullman car "Tiber" carried off the honors as the liveliest party in attendance. Nothing escaped them, with Special Envoy Charles Clark at their head.

Mr. Wm. Robinson, president and general manager of the Robinson Electric Truck & Supply Company, of Boston, was privileged to hear many high compliments for his radial truck.

Mr. J. C. Shainwald, of Chicago, made many friends for the Standard Paint Company, of New York. Mr. Shainwald represents the Chicago house of this very successful company.

Mr. Job H. Jackson, of Jackson & Sharp, Wilmington, Del., received many compliments over the beautiful street car exhibited at Atlanta. It is intended for the Hartford, Conn., system.

Mr. Walter Chur, general manager, ably represented the American Railway Supply Company, of New York.

The Vacuum Oil Company, of Boston, was represented by E. A. Record, the good looking special manager for the whole United States.

The fine voice of Mr. Wm. H. Huelings, Jr., of the Brill company, Phila., contributed a great deal to the entertainment of the travelers on the special over the Pennsylvania railroad and the Southern railway.

Mr. R. S. Brown, Boston, of the Westinghouse company, was also a magnificent entertainer with story and recitation.

President Payne made an excellent presiding officer and business was dispatched quite rapidly.

The beautiful weather continuing the entire week made the occasion of the trip and the visit to Atlanta particularly enjoyable.

The barbecue, Friday afternoon, was a novel sight to nearly every visitor, and it was hugely enjoyed.

The thanks of the American Street Railway Association and their guests at the convention are due to the editors and staff of the Atlanta *Constitution* for the admirable manner in which they handled the arduous business of the convention, and for the personal attention so liberally bestowed. City Editor Adamson and Railroad Editor Remsen Crawford, of the staff, were particularly active in this respect. They ably seconded the members of the local committee in all that was done for the entertainment of the delegates, and those who participated will appreciate what that means. The *Constitution* has the reputation of being the leading journal of the South, and certainly the enterprise and ability displayed on this occasion leave no doubt about that reputation being well deserved.

Mr. T. C. Perkins, vice-president, was the wide awake representative of the Mather Electric Company, of Manchester, Conn.

S. Bowman Wheeler and Charles Yerkes Flanders—the long and short of it—ably and genially represented the long-established house of Morris, Tasker & Company, of Philadelphia. There were no more popular gentlemen at the convention, and they will always be warmly welcomed hereafter. Mr. Wheeler is six feet four inches high, the tallest man at the convention.

Mr. P. C. Ackerman, of New York, was the popular and ubiquitous representative of the American Electrical Works, of Providence. There were many inquiries also for the popular president of that company, Mr. Eugene F. Phillips.

The Railway Officials Thanked.

Representatives from the several cars composing the special train from the East to Atlanta and return, October 15 to 22, assembled in the car "Tiber," at Hickory, N. C., and were called to order by Col. John H. Cunningham, of Boston, second vice-president of the American Street Railway Association, who stated that he had been requested to convene those present for the purpose of giving expression to their appreciation of the attention they had received from the railroad representatives.

On motion of Mr. Charles Clark, Colonel Cunningham was requested to appoint a committee of five with which he was to act *ex-officio*, to draft proper resolutions, and the following named gentlemen were appointed: R. S. Brown, Boston, chairman; Chas. W. Price, New York, secretary; Col. John N. Partridge, Brooklyn; W. L. Candee, New York; I. S. Shaler, Philadelphia. The meeting adjourned and the committee reported later the following preamble and resolution, which were enthusiastically adopted:

Whereas, The ladies and gentlemen composing the special train from New York to the convention of the American Street Railway Association at Atlanta, October 17 to 19, traveling over the Pennsylvania Railroad and the Southern Railway, have enjoyed unusual privileges and advantages over the system of the Southern Railway, whereby they have been enabled to visit the historic grounds of Lookout Mountain and Missionary Ridge, at Chattanooga, Tenn., and view some of the grandest scenery of the world in the Blue Ridge Mountains around Asheville, N. C., and have received unsurpassed accommodations at every point; therefore be it

Resolved, That the cordial thanks of this entire party be heartily extended to the above corporations for their courtesy and kindness throughout.

Resolved, That special thanks are due to W. A. Turk, of Washington, D. C., general passenger agent of the Southern Railway; to S. H. Hardwick, Atlanta, assistant general passenger agent, and to A. S. Thweatt, of New York, eastern passenger agent of the company, for the general plan and arrangement of our itinerary.

Resolved, That we particularly desire to thank Mr. Geo. C. Daniels, New England traveling passenger agent of the Southern Railway, who accompanied us on the entire trip, for his courteous, tireless and unceasing attention, and we do most sincerely congratulate the Southern Railway Company on having such an efficient and obliging agent in their service.

(Signed) R. S. BROWN, Chairman.
CHAS. W. PRICE, Secretary.
JOHN N. PARTRIDGE.
JOHN H. CUNNINGHAM.
W. L. CANDEE.
I. A. SHALER.

Hickory, N. C., October 21, 1894.

THE ATLANTA AND CHATTAHOOCHEE RIVER ELECTRIC ROAD.

SCENES ALONG THE LINE.

On the invitation of Mr. Wm. W. Kingston, and by the courtesy of J. F. W. Darr, superintendent and general manager of the road, a small party of electrical men, pioneers of the convention, were afforded an opportunity of taking a most enjoyable run over the line a few days since and of inspecting some of the points of interest along the route.

The party consisted of W. W. Kingston, of the Johnson Company; E. P. Thomas, his assistant; D. R. Bullen and A. K. Baylor, of the General Electric Company; W. F. D. Crane and W. H. Gould, of the W. H. Johns Manufacturing Company; E. S. Nethercut, of the Paige Iron Works; and H. G. Tuckerman, of the ELECTRICAL REVIEW.

General Manager Darr very kindly placed a special car at the disposal of the party and accompanied them on the trip. The road, though at present in rather an unfortunate condition financially, is admirably built and equipped, and under the able management of Mr. Darr only awaits the further development of the property along its line, which the better times now opening up will bring, to regain its financial standing.

Starting from the center of the business portion of the city it runs through an exceeding picturesque and historical section of the country to within a few hundred yards of the Chattahoochee River, a distance of nine miles. It is undoubtedly one of the most picturesque roads in the country, of electrical equipment, running up-hill and down, through heavy timber, over trestles and past cotton fields and cultivated farms, and traversing battle fields the entrenched lines of which are still plainly visible, as well as the city streets.

The first stop on the outward trip was made at the new Atlanta crematory, which was thoroughly inspected. This plant disposes of one-third of the entire refuse of the city, nothing remaining after the cleansing flames have done their work but small heaps of powdered ashes. The crematory is built under what is known as the Dixon patents, and this system will undoubtedly soon be adopted by all the large cities of the country. A commission for this purpose has already been appointed in New York and Chicago, and will be in Atlanta in the near future on a visit of inspection.

The next point visited was the Winter quarters of the convict camp. Here the chain gangs are housed during the Winter months, and they certainly have very comfortable surroundings. At present they are working on the county roads and public parks, and are divided up into several camps near the scene of their labor. A rather touching memento of the terrible struggle of 30 years ago was shown the visitors by the superintendent of the prison, in the remains of a Union soldier recently dug up by the convicts. His identity was established by means of the metal buckle on his belt and the remnants of his cartridge box. The bullet that killed him was found inside the skull. Another added to the long list of unknown dead. The prison, or barracks, as it is called, is directly in the line of march of Sherman's army and near the battle field of Atlanta. The battle of Peachtree Creek was also fought within a short distance of this spot.

After visiting the power house, the party continued to the terminus of the road, and on the return trip invaded a cotton field and showed the darkies how to pick cotton. A number of admirable specimens were obtained, and as they were exchanged for good coin of the realm, the quondam owners offered no objections.

Several artistic native groups were captured on snap shots by the kodak fiends of the party, greatly to their delight and to the astonishment of the darkies.

H. G. T.

Henry Electrical Club.

This club, which was the outcome of the course of lectures delivered at Cooper Union last Winter, in connection with the university extension and under the auspices of Columbia College, has just completed arrangements with the American Institute of the City of New York to become the electrical section of the Institute.

Hereafter it will meet every Wednesday evening at the rooms of the Institute, 111–115 West Thirty-eighth street.

The object of the club is to hold informal discussions and have papers on practical subjects presented. In addition, one lecture will be given each month by some specialist on an announced subject.

The officers for the ensuing year are: President, W. H. Freedman, E. E.; first vice-president, L. H. Laudy, Ph. D.; second vice-president, Max Osterberg, E. E.; secretary, George Whitefield.

The "Street Railway Journal's" Tenth Anniversary.

The *Street Railway Journal*, of New York, has made its current issue a souvenir of its tenth birthday and of the Atlanta Street Railway Convention. It contains a 16 page article on Atlanta, a 10 page article on the American Street Railway Association, a 30 page article on the street railway systems of the Southern cities, and a 20 page article on the history of the street railway industry. All of these are handsomely illustrated, containing over 400 illustrations, among which are more than 125 portraits of street railway men. The ELECTRICAL REVIEW extends its hearty congratulations to the *Street Railway Journal*, both for the success it has attained in its chosen field and on the production of a superb special number.

The city council, of Visalia, Cal., has granted the Sunset Telephone and Telegraph Company the right to erect telephone poles in that city. The privilege is to exist for only 20 months.

Atmospheric Conditions of Electrically-Lighted Steamships.

A correspondent writes to *The Lancet*, London, September 22, from St. Louis, Mo., as follows:

"Just at the completion of a nine days' voyage I wish to report that several passengers were severely affected with insomnia and an exhilaration to a very marked degree, and which were not relieved by the usual narcotics. These patients were of delicate, nervous temperament, and medical advisers and old sailor fellow-passengers assured them that their condition was caused by the exhilaration of the voyage, salt water, etc.; but to my mind the explanation is not satisfactory. I attribute it to an electrical condition, generated by the machinery itself or by the dynamos used in lighting the ship. I would suggest that a most thorough investigation be made in that field by competent specialists with a view to affording the nervous victims some alleviation."

In reply to this *The Lancet* says, in substance, that "continued proximity to the noise and vibration of machinery in motion may, no doubt, induce insomnia and similar conditions, but that at the same time it is difficult to imagine that the plant used for electric lighting on board ship should have any effect different from that of other machinery. It may be remembered that frictional electricity is often obtainable from the rapidly moving belt of a large machine; but there is no evidence that this is capable of exerting any influence on people near it, and it seems impossible that in an electrically-lighted ship the electricity should leave the proper channels and be constantly flashing from one wire to the other, and in this way passing through the bodies of the people on board." It suggests, however, that it might be interesting to know the system of wiring and distribution adopted in the ship in question, and adds, "Before falling back upon the hypothesis suggested in the above letter, has the writer sufficiently eliminated other possible causes? Especially, is he satisfied that the general electrical conditions of the atmosphere at the time were not sufficient to account for the symptoms named? Sleeplessness, headache, restless irritability are often observed in susceptible persons just before a thunderstorm. There is also evidence that the electrical condition of the atmosphere, by affecting the 'respirability of the air,' or more probably perhaps by a direct influence on the nervous centers, is sometimes a factor in the causation of 'heat apoplexy.' Such points are little understood and not sufficiently studied. It is possible that electricity, both within us and around us, will some day throw light upon many a dark point connected with conditions both of health and of disease."

The Harrison International Telephone Company has located its headquarters for Texas, Oklahoma and Indian Territory in Waco, Tex., and is engaged in organizing a local company to supply the city with a telephone service.

LITERARY.

We have received the proceedings of the second semi-annual convention of the Northwestern Electrical Association, held at St. Paul, Minn., July 18, 19 and 20, 1894.

The success of the pamphlet on "Data Concerning Platinum," issued by Baker & Company, the well-known refiners, of Newark, N. J., has necessitated a third edition, which has been revised and considerably extended in scope.

Col. H. G. Prout's second article about English railroads, the result of a special trip made for *Scribner's Magazine*, deals with "English Railroad Methods," and will appear in the November number. It is especially about the men who manage and work the roads, their various duties, qualifications and characteristics. It is a fact perhaps not generally known that English railroads have no presidents or vice-presidents.

A "Real Conversation" between Conan Doyle and Robert Barr, giving glimpses of Dr. Doyle's home life and his methods of work, and reporting his opinions on the state of the novelist's art in England and America at the present time, will appear in *McClure's Magazine* for November. Several portraits of Doctor Doyle and Mr. Barr and views of interiors in Doctor Doyle's home will accompany the article. Also a photograph of Mrs. Conan Doyle and a portrait of Sherlock Holmes.

"Central Station Bookkeeping and Suggested Forms, with an Appendix for Street Railways," by Horatio A. Foster, member A. I. E. E. New York: The W. J. Johnston Company, Limited, 253 Broadway. Cloth, 139 pages, 75 forms and diagrams. Price, $2.50. Supplied by the ELECTRICAL REVIEW.

This book contains diagrams for the organization of the staff of electrical central stations, the classification of accounts and reports, and includes sample forms for every department. As the name indicates, the work is devoted mainly to the accounting department, both of central stations and street railways, and outlines a complete scheme for its organization and routine, which will enable the management to determine at any moment the condition of business, and particularly the unit cost of the generation and distribution of current. The forms were devised after an examination of several hundreds in practical use in many stations, and are intended by the author to embody the best points of all. Many forms are of actual size in width and printed on paper specially ruled, so that they may be used in ordering. In an appendix is furnished a classification of accounts of electric street railways, together with instructions, forms of books, etc., necessary to carry it out; the other necessary forms being in Part II.

The Town Board of Milton, Saratoga County, N. Y., has granted a franchise to the Ballston Spa Electric Light and Power Company to erect poles and lay tracks for an electric railroad from Ballston to Rock City Falls.